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Towards Sustainable Market Strategies

A Case Study on Eco-textiles and Green Power

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Content

List of figures

List of tables

List of boxes

Abstract

This study focuses on the economic, market-related context of consumption patterns and incorporates the regulatory settings and values. The aim is to systemise the influences on sustainable consumption patterns. Special attention is drawn to the question how existing niche markets could be extended to mass markets. This question is deepened by case studies on the green textile and the green power markets.

The results emphasise the different key factors which influence the successful pathways for an extended green market volume. Looking at the case of the green power market it can be seen how important it is to create an economic and institutional context for adoption. Looking at the case of green textiles the importance of new lifestyles and cultural impacts are obvious.

Looking at the interfaces between institutional settings, supply structure, societal values and consumers' decision-making, it can be seen that consumers' demands are not only a product of individual needs. Therefore sustainable consumption strategies will have to face not only the change of needs, but also the change of structures which influence individual choices.

Zusammenfassung

Diese Studie konzentriert sich auf den ökonomischen, marktbezogenen Kontext nachhaltiger Konsummuster unter Berücksichtigung von staatlicher Regulierung und gesellschaftlichen Werten. Eine besondere Aufmerksamkeit wird der Frage gewidmet, wie bestehende Nischenmärkte erweitert werden können. Am Beispiel der Märkte für umweltfreundliche Textilien und umweltfreundliche Energie werden vertiefend die Erfolgsbedingungen für eine Markterweiterung untersucht.

Als ein wichtiges Ergebnis kann festgehalten werden, dass unterschiedliche Einflussfaktoren für den Erfolg in den untersuchten Märkten verantwortlich sind. Das Wachstum der umweltfreundlichen Energiebereitstellung kann vor allem mit den veränderten Rahmenbedingungen erklärt werden, während das Marktsegment umweltfreundlicher Textilien vor allem durch Lebensstile und kulturelle Einflüsse geprägt wird.

Betrachtet man die Schnittstellen zwischen institutionellem Rahmen, Angebotsstrukturen, gesellschaftlichem Wertewandel und den Entscheidungen der Konsumenten systematisch, so wird deutlich, dass Konsumentscheidungen nicht nur auf individuellen Bedürfnissen beruhen. Von daher ist es für eine Strategie des nachhaltigen Konsums wichtig, nicht nur auf die Veränderung von Bedürfnissen zu zielen, sondern auch die Strukturen zu verändern, die individuelle Entscheidungen beeinflussen.

1 The Topic of Sustainable Consumption

The sustainability agenda has gradually been shifting to include consumption alongside production. Agenda 21 acknowledged the importance of sustainable consumption and production by devoting Chapter 4 to the issue and by delineating areas for action particularly in industrialised countries. In the most common and accepted definition sustainable consumption is seen as "The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations" (Ministry of Environment Norway 1994). It was developed by the Oslo Roundtable in 1994 and formally adopted by the UN Commission on Sustainable Development (CSD) in 1995. (cited from UNEP 2001)

Recent expansions of this definition attempt to capture the social aspect of consumption to ensure that reductions in resource use per unit of products and services are not offset by trends on the demand side that lead to rising quantities of products and services. "The emphasis of sustainable production is on the supply side of the equation, focusing on improving environmental performance in key economic sectors, such as agriculture, energy, industry, tourism and transport. Sustainable consumption addresses the demand side, looking at how the goods and services required to meet basic needs and improve quality of life – such as food and health, shelter, clothing, leisure and mobility – can be delivered in ways that reduce the burden on the Earth's carrying capacity." (Robins / Roberts, 1997)

Thus the issue of changing consumption patterns is very wide-ranging. Efforts to change consumption patterns have used a variety of instruments, including process standards, product standards, environmental taxes, reduction of environmentally harmful subsidies, consumer information, eco-labels, and others. More recently, efforts have been made to combine such instruments into integrated product policies addressing all phases of the product life cycle, including design, production, consumption and disposal. This approach has been driven by the recognition that environmental impacts of products in the consumption and disposal phase can often be addressed most effectively by interventions that influence the design phase. It also recognises that sustainable consumption and production taking economic, environmental and social issues into account requires co-operation among a variety of actors at all phases of product production and consumption. (UN Commission on Sustainable Development 2001)

In the industrialised countries, there has been an ongoing dispute about the importance and influence of private households. The realities of the consumption patterns there do not meet the challenge of Agenda 21 for an efficient use of natural resources consistent with the goal of minimising depletion and reducing pollution. (United Nations, 1993)

- Most of the important ecological indicators show that recent consumption patterns are far from being sustainable.
- The environmental progress made due to eco-efficient strategies has been cancelled out by a rising consumption level (rebound effects).

No wonder, the areas in which consumers can make a significant contribution to sustainable consumption are still largely unexplored.

In its paper "Consumption Opportunities" the UNEP (2001) calls dematerialisation, the efficient consumption of resources, one of the major targets for sustainable consumption. To reach dematerialisation, "...consumption patterns can be optimised by Conscious and Appropriate Consumption on the part of consumers and citizens. However, in between these strategies, there is a need for governments and industry to create a platform of Different Consumption, which facilitates Conscious and Appropriate Consumption."

These different aspects of optimisation are defined as:

- *Different Consumption:* changes in infrastructure and choice mainly engineered by government actions and investment.
- *Conscious Consumption:* more considered 'choosing and using' on the part of confident, educated consumers.
- *Appropriate Consumption:* deep and broad debate in social circles about the type and level of consumption practised, and whether quality of life (particularly in civic, cultural and religious terms) is increased or impeded by consumption behaviour and its effects. (UNEP, 2001)

If it is intended to give consumers guidance, any assessment of the environmental impact of household consumption must permit a comparison of the goods and services consumed regarding their respective environmental impact, and their contribution towards dematerialisation. Doing this on the basis of their contribution to the most debated environmental problems like climate change, eutrophication, etc., necessitates the aggregation of environmental effects. This is a highly complex process based on subjective assessments of relative relevance as much as on scientific measurements. For the average consumer, its components and in particular the weighing factors needed for the aggregation procedure are all but transparent. (Lorek 2001a) Consequently, the usefulness of any such methodology is limited as regards everyday use in shopping decisions. Therefore, transparent and simple information needs to be given to identify the relevant

aspects of consumer behaviour. On the macro level for the national and the global economy as well as on the micro level for individuals and households, sustainable consumption is a process of permanent optimisation. Beside ecological necessities it has to take into account

- social aspects of justice within a country, between countries and for further generations
- economic aspects and
- institutional aspects seen as the legal framework but also the cultural settings and values among people.

Unfortunately the specific research institutes or research projects on sustainable consumption quite often focus on one of these aspects only.[1]

Sociological consumption research focuses on the aspect that the verifiable consumption behaviour of people is embedded in the context of values, attitudes, and cultural impact. (Douglas 1978) It is the baseline of arguing in this paper. The following points are identified as the fundamental factors influencing this change in Germany and elsewhere (Hansen 1999):

- Demographic factors: stagnating or sinking birth rates, partial compensation of naturally weak population growth rates through immigration from third countries, changes in ethnic population structure, increase in life expectancy, and an increasing share of senior citizens in relation to total population.
- Socio-economic factors: changes in family structures, increase in single-person households, structurally continuous unemployment, structural change from industry to services, internationalisation of employment, increasing polarisation between low-income and high-income households (new poor, segregation).
- Socio-cultural factors: loss in significance of traditional values, change in values, pluralistic lifestyles, individualisation, ties/loyalty with established organisations such as the church, trade unions and parties diminish, less importance of employment as a focus in life, increased recreation through reduction in working hours, increasing consumption as a result of increasing recreation, increasing social and symbolic importance of consumption.
- Technical factors: technology push through new technologies and high innovation dynamics, change in everyday life and employment through information and communication technologies.

[1] Scherhorn (1997) provides an overview of the research activities on sustainable consumption.

Political discussions about sustainable consumption focus on the importance of different societal actors, a sufficient regulatory framework and the integration of sustainable consumption issues into the general sustainability discourse.

From the aspect of marketing-oriented consumer research, finally, the primary challenge is to understand the shifts and innovations of demand structures and how supply can meet them.

Both value-based dimensions of behaviour patterns on the one hand as well as the legal and governmental framework on the other affect the economic relationship between supply and demand (Scholl, 1999). Within such a viewpoint product development is influenced by several use-factors which form a typical set of a so-called use-regime (Scholl/Zundel 2000). Those use-regimes represent in different product areas different patterns of demand and supply structures, but they have also different frames of policy-making and different arenas of "public awareness".

Analysing these factors it is important to systemise the relationship between the market-related context and the context of institutional settings and values.
The present paper raises two research questions:

1. What are the driving forces for successfully introducing green products and services on to the market? This will be investigated in the markets of green textiles and green energy power.
2. What can be learned about those different framing factors and their interaction for sustainable policy-making?

2 The Research Approach

2.1 The Constitution of Markets by Different Action Fields

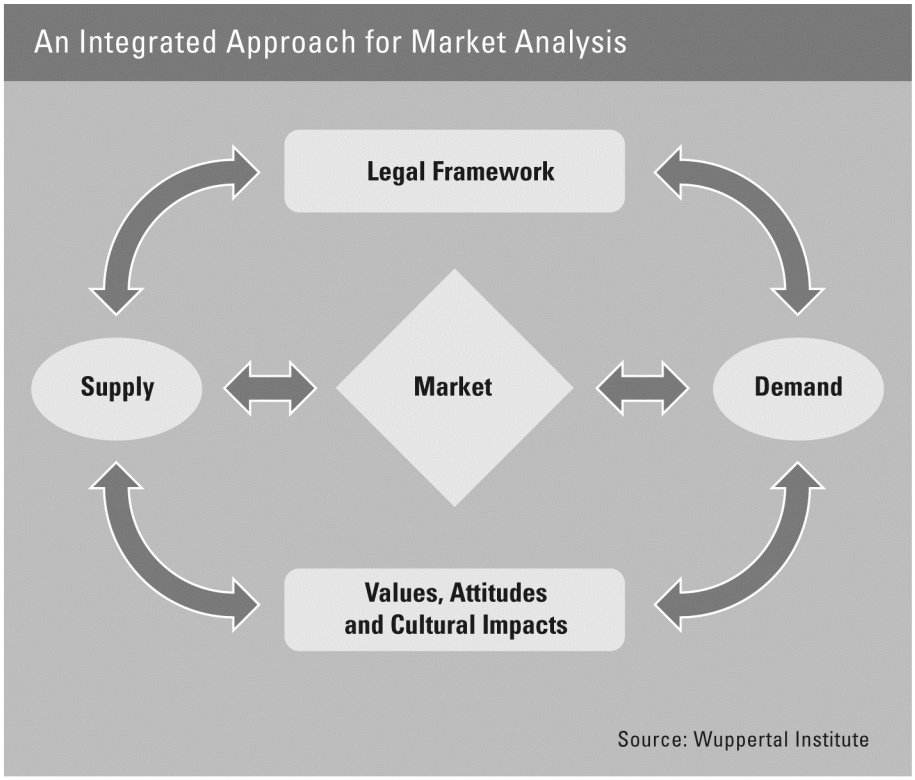
The introduction pointed out the necessity for an integrated approach to sustainable consumption analysis. The following research aims to investigate the prospects for sustainable market(s). This is done within the analysis of intermediate connections and influences of values/attitudes/cultural impact, legal framework, the demand side and the supply side of the market. The innovative aspect of this analytic view is that both supply and demand are influenced by the same frames. But often these frames are only seen as the background to sectoral policies, likewise:

- Legal framework is seen mostly only connected with the supply side (production)

- Values, attitudes and cultural impact are mostly seen as relevant to consumers' policies (consumption)

The intention of the following analytic frame is to overcome these viewpoints and to draw attention to the synergetic potentials in the interlinked areas of the model.

Figure 1: An integrated analysis of sustainable market(s)



Source: Wuppertal Institute 2001

The influences of the market on the legal framework and values/attitudes and the mutual relationship between the legal framework and values/attitudes are not addressed in this study.[2]

To analyse the sustainability of consumption, it is useful to split household consumption decisions into different consumption clusters, because consumers' influence on inducing sustainable development differs among various household activities. (Lorek, 1999)

In most consumption clusters there are tendencies to optimise products and services towards ecological or social sustainability. And in nearly every consumption cluster these products still stay in a niche market – from organic food via low-emission cars to passive houses. In all areas, considerable efforts have to be made to overcome the barriers around a mass market, even if most of these products (eco-cars and food and energy-saving appliances, etc.) have additional advantages such as cost reduction during their use phase or health aspects that make them attractive enough for consumers to opt for them also for non-ecological reasons.

[2] For a research approach to "Markets as Collective Actions", see (Scherhorn, 2001).

There are some consumption clusters which lack these aspects. The textile and the energy markets are examples here. For eco-textiles as well as for green energy, the individual consumers do not benefit directly from the sustainability gain with their consumption decision. A reduction of CO_2 emissions from green energy is an indirect advance only and the environmental benefits from ecologically produced cotton will not affect the (Western European) consumer at all. Here the market faces the typical problems of a common good. (Fischer 2002) That makes the products even trickier to sell on the market. A common disadvantage of these consumption clusters which makes market analysis more difficult is the fact that neither the term eco-textiles nor green power are protected by official regulation. So, in contrast to the situation on the European nutrition market – where EU 2091/92 defines minimum standards – there are products of quite different standards called *eco* or *green* in the textile market or the electricity market.

Chapter 2.3 introduces a recent research approach to overcoming the barriers preventing a niche market from turning into an eco-mass market. Therefore the market for eco-textiles (chapter 3.1) as well as the market for green power (chapter 3.2) are chosen for in-depth analysis in the following.

This study explores how far market structures of ecologically produced goods and services fit into the demand-side necessities and lifestyle attitudes of private consumers. Therefore it focuses on how consumers can be active in their purchase decisions. The ecological aspects of the use phase and final disposal are only taken into account as far as they are influenced by the buying decision.

The analysis starts with a reflection on the environmental relevance of the issue and asks how relevant households are to reducing the burden on the environment. The chapter “legal framework” analyses the laws, agreements and lobbying activities to promote the eco-niche on the way to the mass market and formulates targets towards eco-friendly development.

The market analyses include the supply side, consumer demand, and consumer values. The supply side is analysed along the conventional criteria like structure, main players, and, as far as possible, turnover. Additionally the eco-criteria and labels are reflected. Consumer activities demonstrate the demand for eco-products on the market taking into account market shares and scientific acceptance studies. The cultural settings and values reflect the prospects for the products and the barriers they face besides economic aspects.

Chapter 4 finally assesses the findings of the market analysis within the analysing framework introduced above. Chapter 5 gives an outlook on further research demand.

2.2 Some Pre-analytic Assumptions

The following definitions introduce our pre-analytic view on the research field of sustainable consumption and the role of some key actors.

Sustainable consumption
Sustainable consumption is more than just the greening of products and services. From a demand-oriented perspective on consumption the following social targets are important:[3]

- Fulfilling basic needs for all,
- Building human capabilities,
- The consumption of some must not compromise the well-being of others,
- No mortgaging of the choices of future generations.

It is a multi-staged process to fulfil consumers' needs where each stage is seen as relevant. The consumption process starts with the perception of a need, which is transformed into a specific want, then a concrete demand, and finally into an act of purchase or into other forms of procurement, e.g. leasing, sharing, pooling, trading in, or self-production. Also product-use schemes, e.g. for household appliances, can tremendously influence resource use. And in accordance with the "cradle-to-grave" approach of sustainable consumption, the production and the final stage of disposal are relevant as well. (Scherhorn/Reisch/Schrödl 1997)

Lifestyle and environment
Lifestyles are fundamental and distinctive modes of living and working that are accomplished by persons and groups through socially sanctioned and culturally intelligible patterns of action. Lifestyle possibilities for individuals are constrained by available (and appropriate) choices. But lifestyles are changing – historically, regionally, globally, between generations – and differ between societies with a different cultural background. (Burgess 1992)

Different lifestyles have differing consumptive requirements and environmental impacts. Lifestyle researchers (Sobel 1981¸ Underhill, 1999) ventured that lifestyles associated with higher positions in social stratification systems are likely to be more consumptive and this consumption is related to higher requirements for resources. (Lorek 2001b) Also, consumption choices are more constrained for

[3] The Brundtland Commission's definition can be taken as a starting point for a definition of the concept of sustainable consumption. Nevertheless, it is necessary to take into consideration the fact that the consumers in any society do not have equal access to goods and services due to given social differentiations. A concept of sustainable consumption has yet to be incorporated into political and social questions of distribution (Schrader / Hansen 2001, pp. 17).

persons in lower-status lifestyles, and lifestyle experimentation and flexibility is more likely to occur in marginal lifestyle groups. The environmental effects of lifestyles cannot be tied solely to individual behaviour. Individual behaviour itself is at least partially a "product" of "lifestyle engineering" by business supply strategies supported by government action (e.g. through subsidies for consumption of new housing, highways, infrastructure for communication, etc.). And lifestyles, and their environmental impacts, are also shaped to a significant degree by mass media portrayals of "how we live" and "how we want to live".

Stakeholders

Stakeholders in the field of consumer policy can be defined as "all those people or organisations who are either affected or who can affect the performance of various functions at the household level" leading to the following differentiation (Pacchi, 1998):

- supply-side stakeholders (companies and trade associations from various industrial sectors),
- demand-side stakeholders (household members, consumer organisations),
- regulators/policy-makers (at different levels),
- researchers, experts and media,
- independent organisations (like environmental NGOs).

Individuals as social actors

Looking systematically at consumers as social actors, it becomes obvious that consumption decisions are important for the kind and volume of material flows in society. Behind this decision-making there are – as mentioned – a lot of steering factors like income, needs, knowledge and symbolic attitudes. But besides being consumers, private household members have more tools to influence markets. As citizens they vote in elections and thereby indirectly influence the legal framework of product and consumer policy. The strength of this kind of influence in practice becomes clear in the debate on BSE, which led to new standards for meat production in Germany and Europe. Both aspects, selecting products and acting as citizens in an open society, indicate the offers of companies (if their offers are accepted or not). (Hansen 1997)

Private households

The household is understood as an economic unit of persons (one or more) who live together and spend a common budget. To divide it into units that can be handled analytically, consumption researchers focus on different household

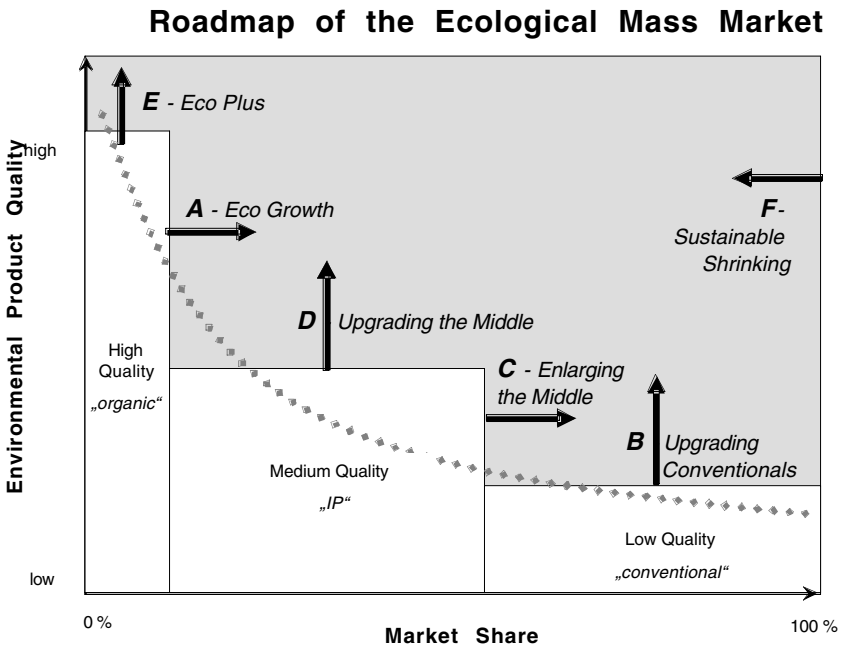
functions and household types. These functions serve to satisfy the needs of household members and could also fulfil sustainability targets with many different options.

2.3 Market Dynamics – How to Leave the Eco-niche

Chapters 3 and 4 analyse the markets for eco-textiles and green energy. This chapter integrates the insights from the specific markets into a more general view of sustainable market development. It first takes up some structural concepts to describe demand and supply-side structures for a successful eco-product market.

In previous research, scholars at St. Gallen University, Switzerland, have developed several tools to analyse the pathway of eco-products towards the mass market. One important approach is described as a roadmap of the ecological mass market.

Figure 2: Roadmap of the ecological mass market



Source: Wüstenhagen/Meyer/Villiger 1999, English translation by Rolf Wüstenhagen

Several ways of spreading the range of ecologically produced goods – or even more generally, to reduce environmental pollution caused by a market – are conceivable. The first, of course, is the growth of the eco-product share. A second quite common approach is an ecological upgrading of conventional products,

often caused by regulatory reasons (banning of hazardous ingredients, for example). Further possibilities are a greater market share of products of medium (environmental) quality (spread of products with eco-tex 100, for example) or upgrading the medium quality (sharpen the criteria for eco-tex 100 products). Finally it is also conceivable to define even higher standards for eco-products, an eco-plus, or, last but not least, to shrink the market. (Villiger 1999)

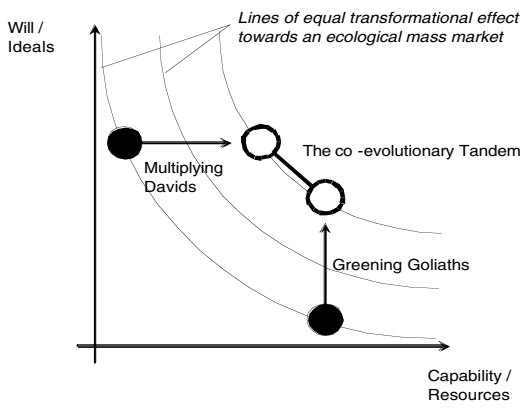
To induce developments on the map of the ecological mass market, the actors on the market have to act.

On the supply side, Villinger, Wüstenhagen and Meyer identified two main groups of players having an important impact. On the one hand, there are the small innovative enterprises (they call them Davids) with a strictly ecological philosophy and product range. On the other, there are the large, well-situated players on the market (called Goliaths) who discover that eco-assortments within their product range may benefit them and/or boost their standing on the actual and future markets. While the small niche enterprises are mostly guided by high ideals and a mission, their ability to fulfil the needs of the mass market are quite low. The big players, on the other hand, already have the power and the standing in the mass market to influence developments, but their willingness to do so is much lower and pragmatic in tendency.

An increase in the number of eco-pioneers, of Davids, as well as an increase in more ecologically produced goods in the supply of Goliaths, can help to transform the market towards an ecological mass market.

For a real transformation of the mass market into an eco-mass market the best option is an adequate development of both these players, Davids and Goliaths. (Villiger, 2000)

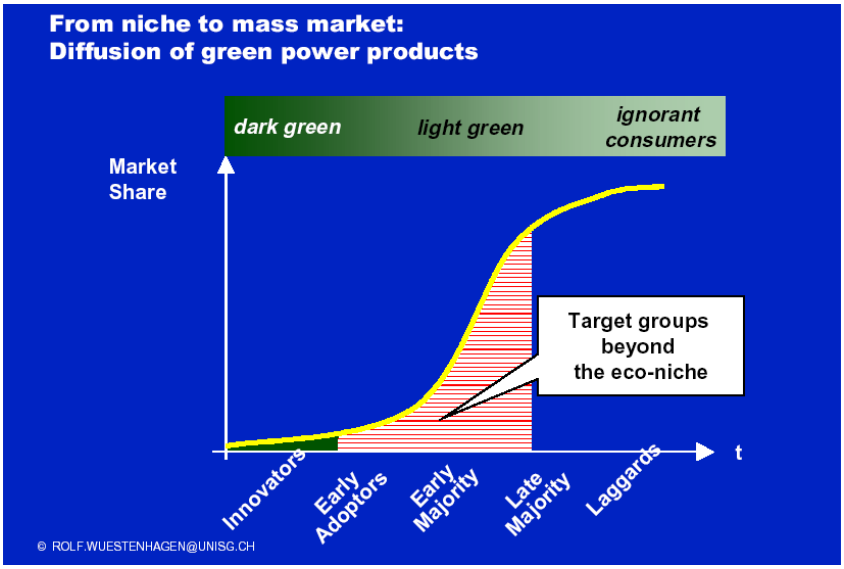
Figure 3: Co-evolutionary tandem of ecological market growth



Source: Wüstenhagen 2000, English translation by Rolf Wüstenhage n

On the demand side, consumer analysis shows: between consumers already behaving in an ecological way (innovators) and the uninterested, ignorant and never accessible consumers (laggards), there is no homogeneous indifferent consumer group but (at least) three types of customers who are willing to follow ecological consumption criteria sooner or later. They range from 'early adopters' who are interested in buying ecologically as soon as the price is adequate in their view to the 'late majority' who will buy ecological products because everyone is buying them. Between those two groups lies the most interesting one of the 'early majorities'. Their acceptance of eco-products can trigger the take-off for the ecological mass market. (Villiger, 2000)

Figure 4: Diffusion of green products: the example of the green power market



Source: (Wüstenhagen 2000)

These models developed at St. Gallen University are very helpful in understanding the dynamics for the positioning of suppliers and developing marketing strategies towards the right target group. What does this mean for eco-marketing?

Getting out of the eco-niche by stressing green benefits over other product characteristics seems to be less and less possible nowadays. The importance of green benefits has decreased in relation to other criteria due to several reasons (unemployment, new poverty, decreasing visible damage to the natural environment, etc.). Green products are mostly credence goods. Their environmental superiority in comparison to competitors' goods can usually not be identified by customers. Successful positioning means defining a target group in the market, identifying best its current specific needs, and creating a unique selling proposition that fits with the company's competencies and the target group's needs. (Meyer 1999)

To get out of the eco-niche, there are two possible ways to go: (1) Position a firm in the niche and widen the niche afterwards or (2) position it towards mass-market target groups right from the beginning. The first path is regularly followed by the Davids. The second one could be more interesting for the Goliath mass-market companies that want to show their environmental responsibility but do not want to position themselves green only.

A lesson that has to be learned from the past is that traditional efforts of eco-marketing will not help to overcome the barrier between the niche and the mass market. Common marketing strategies try to overcome the barrier between ecological knowledge and ecological behaviour. The underlying assumption is that ecological criteria per se are a positive attribute. (Fischer 2002) Such marketing efforts target a small group of ecologically interested consumers only who are able and willing to pay higher prices for ecological reasons. If enterprises additionally use separate and unusual distribution channels, the niche becomes a 'self-fulfilling prophecy'. The requirements to position beyond the eco-niche are different from those within the niche. It takes more than simply applying these needs for eco-niche customers to communicate with mass-market consumers. (Meyer 1999)

As a further aspect, eco-positioning is not only limited to products. Especially in green issues, it is necessary to consider the positioning of a company as an entity, too. Corporate image and credibility are preconditions for the successful sale of green products. It takes more than focusing only on customers. Other stakeholders should be the target, too. (Meyer 1999)

In addition to the general obstacles there are special barriers in every individual market. For green energy, for example, the consumers' impression is of unnecessarily high prices. The main barrier in the textile market is that most customers identify eco-textiles as clothes without form, colour and fashion. So advertising with the "extra" eco can have the contrary effect.

3 A Market Based Survey

3.1 Eco-Textiles / Clothing

Clothing is an important aspect of everyday life. Together with nutrition and shelter, it forms part of human basic needs. Obviously, clothing has always fulfilled far more purposes in societies, and not only in modern ones. Special clothes or colours showed the social rank of their bearers in former times and make you part of a special peer group nowadays. (Enquete-Kommission "Schutz des Menschen und der Umwelt" des Deutschen Bundestages 1993, p. 227)

The textile and clothing industry has experienced a deep structural change in all leading industrial countries. This has been caused by the high competitive pressure through so-called “cheap labour countries” on the one hand and by the general advantages of an international division of labour on the other. Far-reaching rationalisation of production processes and adjustments to range have been made to at least be able to maintain the textile and clothing industry’s production plants in the leading industrial nations.

In 1999 the German clothing industry employed, on average, about 124,000 people in approximately 1,230 plants – representing a share of 1.9 percent of all industrial employees. Against the background of an increase in the relocation of production facilities, of growth in home imports, of the extension of sub-contracting and outsourcing as well as the current recession, the number of employees in the clothing industry has dropped by about 36,000 since the end of 1991.

Textile consumption depends very much on trends of fashion. Due to this, there are strong ties of the textile and clothing industry to the wholesale and retail trade. Trade considers itself a gatekeeper of consumer demands.

In respect to the use of resources, the textile and clothing industry holds a special position. It is strongly connected to agricultural “Third World” production through the use of natural fibres like cotton and to the chemical industry through the use of chemical fibres. Both fields face very different ecological problems. In a first step, the basic quantity shares will be presented.

In 1999, approximately 56.3 million tons of textile fibres were produced worldwide; the share of cotton was 39 percent (19.02 million tons), the share of wool was 2 percent (1.38 million tons) and that of chemical fibres was 54 percent (30.46 million tons). Quantitatively, silk and linen were insignificant. However, jute has gained a share of 7 percent of the textile market, representing 4.02 million tons in the meantime. The share of natural fibres is falling whereas the share of chemical fibres is constantly rising.

Cotton is the leading fibre used in Germany, holding a share of 53 percent or 354,000 tons, followed by synthetic chemical fibres with 143,000 tons (with 21 percent alone for the chemical fibres polyester, polyamide and polyacryl). With approximately 36,000 tons, wool only accounts for 5 percent of resources used.

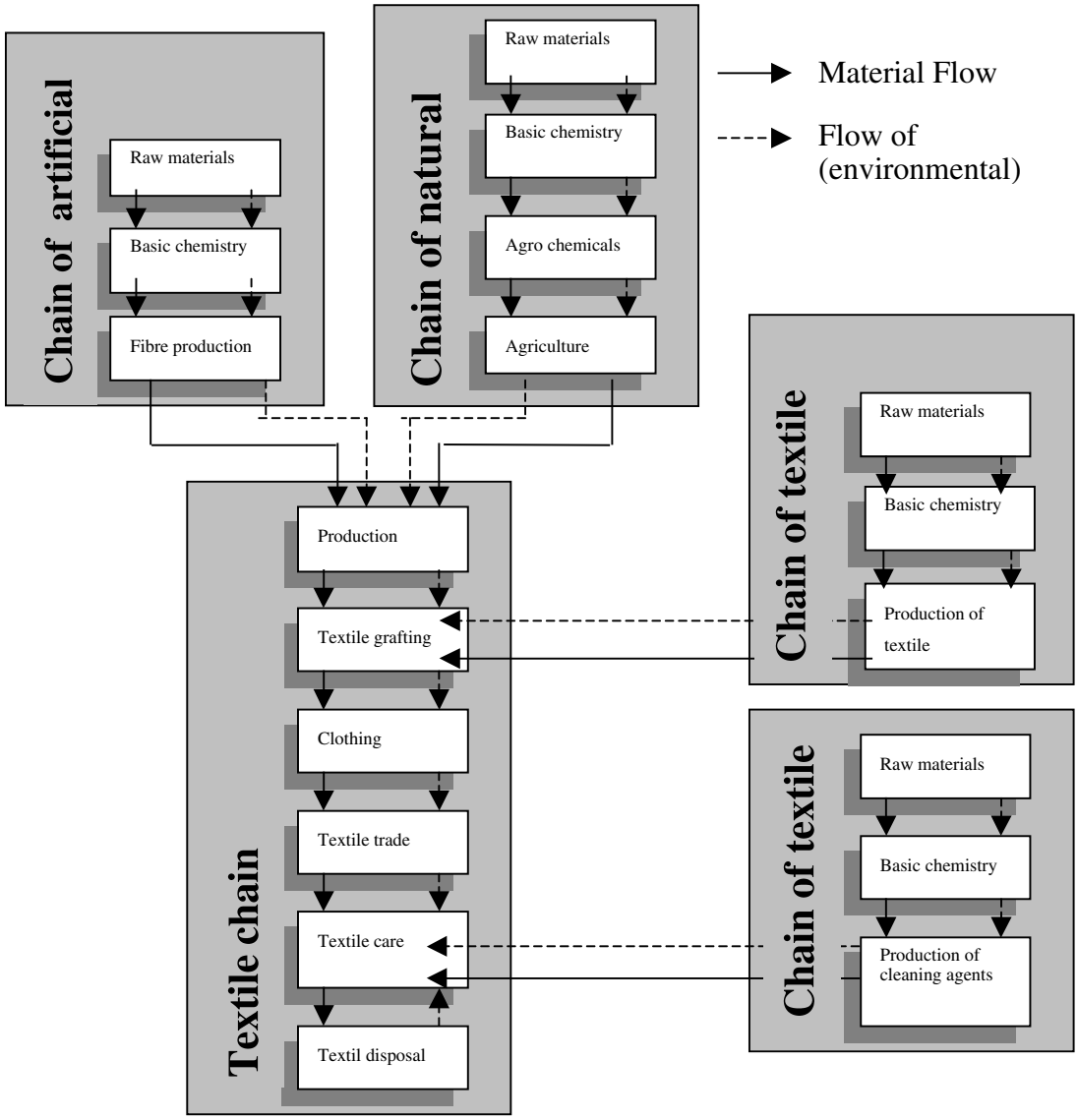
In 1999, approximately 17 billion EUR was spent on textile clothing in Germany. The clothing industry holds a share of 0.44 percent of the GDP. The corresponding trading figures are surprising: imports hold a share of 90.7 percent (!) of all the clothes bought in Germany. On the other hand only 171,000 tons were produced in Germany, of which approximately 131,000 tons were exported.

All in all, the share of clothing in households' total spending has been decreasing in recent years: in 1975 this was a share of 8.8 percent in a household of average income with 4 members; by 1985 it had decreased to 7.8 percent. In 1999 the average German spent around 100 EUR per month on clothing. This is a little less than 5 percent of the available household income. (Federal Statistical Office 1999) But it makes Germany one of the leading nations in per capita textile consumption. (Federal Environmental Agency (UBA) 1997, p. 214)

3.1.1 Sustainability Challenge

From the angle of material flows, the consumption cluster clothing is not one of the priority fields of action. (Lorek 1999) It is responsible for six to seven percent of Germany's primary energy and material use and about the same amount of emissions of CO_2, SO_2, and NO_x. (BUND/MISEREOR 1996) However, at the beginning of the nineties, the Enquete Commission of the German Bundestag decided to take the textile chain – which could be even better described with the diagram of a textile network – as an example to evaluate material flows within a consumption cluster. The important criteria were the complex intertwinements of substances, processes and international trade. (Figure 5)

Figure 5: Intertwinements of the textile chain



Source: Spiller (1996)

Every step of production is connected with the input of numerous chemicals and auxiliary materials, high energy use and wastewater loads. Furthermore, the textile chain is an example of high economic and social relevance. (Enquete-Kommission "Schutz des Menschen und der Umwelt" des dt. Bundestages 1993, p. 270) Therefore, social aspects of sustainability are heavily affected by the recent form of textile production. Chiefly in the developing countries, health standards as well as important labour rights are abused in many textile factories. The textile chain can be seen as a baleful string which links ecological and social problems in the countries of origin with consumer protection. (Schmidt, 2002) Meanwhile, genetic engineering is an increasing aspect of concern as well. (Bund für Umwelt und Naturschutz 2000, p. 5)

Increasing demand and supply of eco-textiles is seen as an important factor towards a more sustainable textile chain. It contributes to less resource use (mainly water) and reduces toxic chemicals in the cotton fields as well as in production processes.

In general, the ecological burden along the textile chain also comes from the use phase and final disposal. Indeed, several studies argue that washing and drying during the use phase are very important aspects of environmental burden. On the other hand, water and energy consumption for textile care depend very much on the respective kind of textile production. A high degree of chemicals and auxiliary materials in the production process can reduce the necessity of high temperatures for washing, for example. (Bode, 2000; Grieshammer, 1997) As the study is about the marketing aspects of eco-products, the questions of use and disposal are not addressed here.

Relevance of household activities
Household decisions are highly relevant for the development of the textile market. The German per capita consumption of clothes is about 11 kg.[4] This is nearly one half of German textile consumption. The other parts are household textiles (13 percent) including tableware and pillowcases, for example; textiles for furniture, etc. (19 percent) and industrial textiles (20 percent). (Dönnebrink, cited from Schramm 2000)

Beside households, public institutions with uniformed personnel (military, police, etc.) are another important factor. These public consumers could use the advantage of their large demand volumes to push innovations. (Bund für Umwelt und Naturschutz 2000, p. 6) This study concentrates on households.

3.1.2 Legal Framework

Due to the global intertwinement of the textile chain, the options for national policy to induce sustainable development in the textile industry are rather limited in general.

As mentioned above, the Enquete Commission of the German parliament attached great importance to the material flows along the textile chain in the early nineties. As a result, the willingness to support eco-textiles grew from the political side.

The German Environmental Agency (UBA) formulated the main tasks of policy decision-makers in the following aspects:

[4] This is about 4 kg above the European average.

- to define targets of environmental quality and environmental behaviour
- to overcome information barriers
- to build up knowledge about ecological weaknesses along the product chain and to forward this information to the relevant actors
- to supervise possibilities and barriers for actor-specific options and to promote co-operative solutions and
- to set the legal, economic and social framework for an appropriate material management.

(Federal Statistical Office 1999)

In 1997 the SPD Parliamentary Party of the German Bundestag – an opposition party in those days – submitted a proposal to pass a law on eco-textiles. It aimed to harmonise the eco-label flood, to formulate strong and provable criteria and to design labels in a way that would give consumers understandable and easily comparable information. Combined with the eco-label, the proposal asked for the development of an accompanying document for all cloth containing a full declaration of all materials, auxiliary materials, and pesticides. As a contribution to the social aspects of sustainable textile production, it should also give information about the origin of the fibres as well as the place and method of production. (SPD - Fraktion des dt. Bundestages 1997)

Since this time political debates to strengthen the market position of eco-textiles have tailed off. Above all, the textile manufacturing industry identified more barriers than potentials for an offensive ecological design of production processes. It was argued that the most important reason was the world-wide competition between countries and economic regions which undermines national co-operation models towards better resource management. (Lucas, 1996)

To push the textile industry toward a more ecological development, the Federal government has funded research. (Balzer 2000, p. 369) In 1998, a tender was announced to support integrated environmental protection in the textile industry. The projects funded were mainly about reducing harmful substances in sewage.

Targets

Targets for sustainable clothing are at different levels. They comprise fibre production, social and environmental problems along the product chain and sufficiency aspects.

In its final report “Shaping Industrial Society”, the German Parliament’s Enquete Commission of Enquiry worked out a systematic investigation of the material flows concerning the demand for textiles/clothing. It traced the following points as central ecological problems of the textile production line:

The throughput of materials has direct negative impacts on ecology and health. Due to the strong international division of labour, transport rates are highly significant.

The customer’s demand for colourfastness leads to the use of dyes which are seldom biodegradable. Dyes on a natural basis raise other problems concerning the risks.

The disposal phase must be considered a serious social and ecological problem for developing countries.

The Federal Environmental Agency names the elimination of hazardous substances and the development of environmentally friendly alternatives as the main target for textiles. This chiefly implies zero emission of persistent and bioaccumulative substances as well as substances with mutagen or endocrine effects during the whole production process. (Federal Environmental Agency (UBA) 1997, p. 204) A further aspect is the reduction of water squandering.

From the social side, working conditions, above all, have to be improved. Avoiding child labour and keeping the norms of the *International Labour Organisation (ILO)* are important targets. (IG Metall 2001)

Box 1: Workers rights in the (textile) industry

All governments in the United Nations have agreed that:

- All human beings are born free and equal in dignity and rights.
- Everyone has the right to life, liberty and security of person.
- No-one shall be held in slavery or servitude.
- No-one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

Workers' rights are human rights and it is the fundamental right of everyone:

- To have just and favourable conditions of work.
- To get equal pay for equal work, and suffer no discrimination.
- To get just and favourable pay, giving the worker and his/her family "an existence worthy of dignity".
- To form and to join trade unions to protect our interests.
- To have rest and leisure, reasonable working hours and paid holidays.

(United Nations Universal Declaration of Human Rights. Articles 1, 3, 4, 5, 7, 23 and 24)

Many other workplace rights have been recognised too, such as:

- The workplace must be safe and healthy.
- Workers must not face discrimination.
- Workers have the right to have and care for children at the same time as being a worker.

The ILO Core Conventions declare the fundamental rights (ILO Convention Number):

- The freedom to form and join trade unions (87)
- The right for trade unions to negotiate with employers (98)
- An end to forced labour (29 and 105)
- Minimum age for workers (138)
- An end to discrimination in the workplace (100)
- Equal pay for equal work (111)

Source: http://www.cleanclothes.org/codes/edu-hbwr.htm

Social organisations such as those involved in the *Clean Cloth Campaign* recommend as sustainability targets that at least a binding commitment be pledged to observe the social minimum criteria as declared in the UN Human Rights and the *International Labour Organisation (ILO)* listed in Box 1.

From the consumers' side it has to be remarked that a reduction in demand towards the European average of 7 kg per capita and year would (at least) take environmental burden off the textile chain. (Bund für Umwelt und Naturschutz 2000, p. 29)

3.1.3 Market Analysis

The market for eco-textiles in Germany has existed for more than a quarter of a century. *Hess Natur* developed mail-order trading for baby wear in 1976 with the aim of offering healthy baby wear and underwear made of natural material only.

Over the years the health aspect developed further but so did the insight that greening the textile chain not only means minimising the toxic burden for the consumers but also reducing or avoiding toxic substances and other environmental harm along the textile chain. So in the beginning of the nineties – at the height of environmental awareness among consumers – eco-textile companies as well as traditional clothing producers became more offensive and offered clothing from natural fibres with improved ecological criteria. But after a short period when eco-fashion was "en vogue" with cloth from ecologically produced natural fibres, natural colours and comfortable cuts, consumer interest moved towards other aspects of clothing again. Grundmeier assumes that upcoming interest in eco-textiles is a fashion trend itself in the ephemeral world of fashion. (Grundmeier 2001) [5]

The main development during the last decade was the significant distinction between actors focusing on health aspects only and those taking broader environmental aspects into account. This created two very different kinds of criteria, both of which are a basis for products called eco-textiles. One philosophy took the ecological burden along the production process as the main element with textiles from organically grown cotton as a special issue. The other focused on the toxic residuum on the cloth as the most important aspect. Table 1 explains the differences.

Table 1: Textile categories sold under the term "eco-textiles" [6]

Production Ecology	Human Ecology
This refers to the process of production and manufacture of fibres, textiles and garments which should be environmentally friendly, and should satisfy the rational conditions for the conservation of air purity, water purity, waste treatment, and for protection against noise.	This is based on the effect garments have on the users and on their near surroundings. Concentration of substances which, according to our present knowledge, could induce dangerous effects on humans during normal use must be avoided in the textiles.

Source: Oeco-Tex Standard 100, Grundmeier (2001)

[5] For the historical development of the Swiss eco-textile market in the nineties see (Meyer, 1999). It is comparable to the German situation.

[6] The original source names a third segment "Disposal Ecology". This concept is based on the disposal of textile products either through recycling, or decomposition without release of harmful substances, or thermal elimination without endangering the conservation of air purity.

The market for textiles with reduced or minimised toxic residuum in the product quickly developed into a strong mass market. Under the name *Oeco-Tex Standard 100* (for details see below), an international certification standard was established. From the start in 1993 to the end of 1999 nearly 16,000 independently controlled certificates were given for cloth and other textiles with close skin contact like bedding materials and so on. Good marketing, easy and controllable criteria, the focus on health aspect as consumers' main concern and the internationality of the approach proved to be a successful basis for a quick step into the mass market. Meanwhile even discounters such as *ALDI* (only) offer *Oeco-Tex 100* certified underwear and bedclothes.

Independent of the market success of *Oeco-Tex 100,* environmental organisations and other stakeholders in the eco-textile industry argue the *Oeco-Tex Standard* guarantees criteria of toxically reduced textiles only, which should be obvious anyway and which is a common standard in Europe. (Brian 1997; Villiger, 2000)

But in the marketing and communication of textile retailers, clothes accomplishing criteria of human ecology as well as those fulfilling the much more elaborate criteria of production ecology are both called "eco-textiles". And they are recognised by consumers as part of a diffuse cluster of eco-textiles. So the doors to confusion among customers are wide open and reduce their ability to make ecologically responsible decisions.

This might be one, but certainly not the only, reason why the more ambitious textiles which are oriented to the criteria of production ecology, still remain in a niche market. The further investigation focuses on these textiles. It only comes back to the *Oeco-Tex Standard 100* in the chapter about labels.

3.1.3.1 Supply Side

In the very beginning pioneers of the production ecology textile market started with lofty ambitions to produce clothes as naturally and environmentally friendly as possible. 100 percent natural materials – even for buttons and yarn – of certified organic origin was the target. Also, the auxiliary materials had to be recyclable or biologically degradable. These technical goals were combined with the idea of comfortable wearing and a long-lasting look. So eco-textiles quickly had the image of 'non-fashion' clothes. Up to now, the branch has been fighting against this image.

Box 2: Relevance of mail-order trade

The majority of eco-textiles (80 to 90 percent) are bought via mail-order trade. In the textile market the relation between stores selling clothing and mail-order trade is that mail-order traders have less than a 10 percent market share, which turns it into a niche market itself. So eco-textiles are a niche market in a niche market.

Relevant actors left their hard-line position a while ago, accepting synthetic fibres for special purposes, and recognising that fashion trends cannot be neglected if one is to survive on the market. So the producers and traders of eco-textiles have been employing more and more managers with experience in the conventional market. (Balzer 2000)

During the last decade the market for production optimised eco-textiles was significantly influenced by two different kinds of players. One important group comprises the companies organised in the *International Natural Textile Association (IVN)*. The other is the huge mail-order traders. While the members of the IVN are small and medium-sized enterprises with mostly a 100 percent supply of natural textiles, the important mail-order traders offer only a small share of eco-products in their catalogues.

IVN – The eco-pioneers

From the ecological point of view *IVN* members represent the highest ecological ambitions. As the term natural textiles suggests, natural fibres are used which are produced and treated in an ecological way.

Members of the *IVN* had a turnover of about 250 million EUR in 1999; half was by eco-mail-order traders, the other half by small retail shops. In total that was not even 0.5 percent of the estimated volume of the textile market with about 60 billion EUR[7]. More recent figures are not available. The number of eco-textile shops tends to be decreasing, and so will their turnover. In 1995 over 500 of them existed. By 2000 their number were estimated to be 200. (Balzer 2000; Fischer, 2002) The eco-mail-order traders are in a slightly better position. From the beginning up to the middle of the nineties the market grew partly by over 10 percent a year. Available data from 1997 shows the following annual turnover of the most important eco-mail-order traders. (Table 2)

Table 2: Annual turnover of eco-mail-order traders in 1997

Hess Natur	56 million DM
Panda Versand	25 million DM
Waschbär Umweltversand	15 million DM
Alb Natur	7 million DM
Köppel Versandhaus	4.2 million DM

Source: Balzer, 2000

In January 2003 the natural textile industry held its 11th InNaTex fair. For three days nearly 200 national and international exhibitors presented their fashion and discussed labelling, consumer information and the flow of goods.

Traditional mail-order traders – the step towards broader consumer segments

In the beginning of the nineties textile retailers started to use their market force to implement ecological criteria in the product chain. In the main, several mail-order traders in the conventional market started as first movers. (Villiger, 2000) Unlike the smaller IVN members they mostly focused on an optimisation of the product chain instead of natural textiles. They developed eco-lines for their catalogues. Examples are *Future Collection* by *OTTO Versand* and *Beautiful World* by *Neckermann*. The eco-collections were presented in a "shop concept". Special pages with the eco-wear were inserted into the regular catalogue. The success of this concept varies.

Neckermann extended their eco-collection from fashion for women only to men's wear and children's wear as well. In 1999 nearly 100,000 pieces were sold from the *Beautiful World Collection* out of a total of over 16 million pieces sold from the main catalogue.

Figure 6: Neckermann's eco-balance of goods

Öko-Bilanz Ware 2001

Input		Output	
Warenbeschaffung	*Stück*	Warenausgang	*Stück*
Gesamt	65.539.450	netto	59.606.478
Textilien	47.061.887	Kundenversand Deutschland	37.912.273
Hartwaren	11.483.573	Hauptkatalog	14.588.202
Sonstige	6.993.990	- davon Artikel mit Umweltprädikat	192.098
		- davon Beautiful World - Artikel	61.308
		- davon Artikel mit Umweltbutton	3.620.048
Transporte	*Millionen Tonnenkilometer*	- davon Artikel mit Neckermann-	
Gesamt	421,5	fremden Umweltzeichen	103.934
See	276,1	- davon Artikel ohne Umweltauslobung	10.610.814
Binnenschiff	5,3	Sonstige Werbemittel	23.324.071
Bahn	3,8		
LKW	116,9	Verkaufs- und Transportverpackungen	*Tonnen*
Luftfracht	12,4	Gesamt	19.469,9
Kombiverkehr Sea/Air	2,6	Papier/Pappe	17.913,5
Kombiverkehr LKW/Bahn	4,4	Kunststoffe	1.393,1
		Holz	163,3
Rücknahme Altgeräte			
zur Verwertung	*Tonnen*		*Stück*
Gesamt	*37,3*	Schuhbeutel	250.000
		Emissionen	*Tonnen*
		Kohlendioxid	23.422,7
		Kohlenwasserstoffe	34,8
		Stickoxide	355,6
		Kohlenmonoxid	68,9
		Schwefeldioxid	81,8

http://www.neckermann.de/umwelt/bericht/umweltfakten2002.pdf

OTTO, on the other hand, continuously reduced the articles in the *Future Collection* programme from 1996 on and dropped the concept with the spring/summer 2002 catalogue. Instead, *OTTO* integrated eco-textiles into their regular pages. The most important project now is to increase the share of textiles from organically grown cotton. The range of organic cotton articles was expanded

Box 3: German "Otto-Versand": Environmental management leads to countable results

- More than 500t of cotton from controlled biological cultivation continues to be used. This makes Otto the world's fourth major processor of organic cotton.
- Ecological optimisation of the clothing process chain has been furthered by a dye concept that saves on resources and costs.
- In the autumn/winter 2001 season, the range included 165 items made of organic cotton with the participation of Group companies 3 Suisses, Baur and Witt Weiden.
- The range of clothing checked for harmful substances in the spring/summer 2002 season has grown from 65% to 70%.

considerably from 270 tons in 1999 to over 530 tons in 2001. This is 1.5 percent of the textiles offered. The knowledge gained from the ecological optimisation of textile production in the *Future Collection* has contributed significantly to the manufacture of the organic cotton articles. (OTTO Versand 2001)

"Otto is now amongst the top-flight cotton processors world-wide which use cotton originating from controlled biological cultivation. The range already includes many items, particularly in women's outerwear, but also in household textiles. Considerable reductions in water and power consumption, the use of chemicals with maximum compatibility with the environment and the skin, ensure that textiles from Otto made of organic cotton are not only comfortable to wear, but that the production methods used, geared to sustainability, effectively protect resources. A new dye standard developed in cooperation with suppliers is also environmentally compatible".[7]

QUELLE also measures the development of eco-textiles in the integration into the main catalogue. For spring/summer 2001 *QUELLE* offered ecologically optimised textiles on about 300 of the total 1,542 pages. Half of these refer to the category "skin-friendly fashion" according to the *Oeco-Tex-Standard 100,* while the other half are additionally manufactured in an environmentally friendly way without chlorine in bleach and fittings, without formaldehyde and without dyes containing heavy metal. (Quelle 2002)

[7] Annual report 01/02, p. 40 ff. (Chapter: Environmental and social responsibility)

Unlike Germany, Switzerland has an impressive market share of eco-textiles. This is a result of the activity of two main retailers *Coop* and *Migros*. *Coop* (re)started the *Coop Natura Line* in 1995 as a brand for an inexpensive eco-collection based on ecologically grown cotton. In response, *Migros* developed their brand *eco products* on the basis of production ecology along the textile chain. Their target is to offer 2/3 of their textiles within the *eco products* criteria. These criteria also contain aspects of ethical production.

Figure 7: Supply of eco-textiles from OTTO Versand

	1997		1998		1999		2000		2001	
	I	II	I	II	I	II	I	II	I	II
1 ABSOLUTE VALUES										
1.1 Number of human ecology optimised textiles (tested for hazardous substances)										
1.1.1 Models	498	528	729	813	1.027	1.154	1.549	1.767	-*	-*
1.1.2 Articles	2.395	2.493	3.036	3.947	4.878	5.539	6.580	7.192	7.580	8.138
1.2 Number of production ecology optimised textiles (FutureCollection)										
1.2.1 Models	80	85	61	45	30	27	24	31	24	27
1.2.2 Articles	241	166	143	75	71	47	52	43	32	38
1.3 Number of totally optimised textiles (organic cotton)										
1.3.1 Models	-	-	-	-	-	21	29	51	86	69
1.3.2 Articles	-	-	-	-	-	89	98	140	221	165
2 RELATIVE VALUES										
2.1 Percentage of human ecology optimised textiles (articles) in total range	19	19	27	35	45	52	56	62	65	69
2.2 Percentage of production ecology optimised textiles (articles) in total range	1,9	1,3	1,3	0,7	0,6	0,5	0,4	0,37	0,27	0,32
2.3 Percentage of production ecology optimised textiles (articles) in ladies' outerwear range	6,5	5,2	5,2	3,6	2,8	2,2	2,7	2	1,3	1,45
2.4 Percentage of turnover of ecology optimised textiles of total textiles turnover	14,7	18,9	27	31	N/A	N/A	N/A	N/A	N/A	N/A
3 QUALITATIVE VALUES										
3.1 Range of textiles from ecologically cultivated cotton	+	+	+	+	-	+	+	+	+	+

Source: www.otto.de

Textile labels

IVN estimate 70 eco-seals on the German textile market. Most of them are more brand names of companies than independent, controlled and certified seals. (Balzer 2000, p. 369). The *Verbraucher Initiative*, the German alternative consumer organisation, refers to 13 textile seals on its Internet platform "label-online". Most of them are independent. Only *Green cotton* is a brand name. In the middle of the nineties it was quite well-known on the market.[8]

However, most of these seals are not relevant at all. Most of the textile labels are not well known (less than 20 percent in a supported survey). *Wollsiegel,* a label with long tradition of sealing woollen products which do not refer to ecological criteria, has a high percentage of recognition. So does the *Panda* used on textiles sold from the *Worldwide Fund for Nature (WWF)* which also uses that emblem as its organisation logo. In any case, most of the consumers do not make decisions by labels, and even the fact that they recognised them in the survey doesn't mean they knew what they were about. (GfK - Textilmarktforschung 1999)

Only two labels deserve more attention: the *Gütesiegel Naturtextil* and the *Oeco-Tex Standard 100,* which was mentioned before. While the former focuses on the fibre and the production process, the latter only concentrates on the aspect of human ecology.

Figure 8: Labels of the "Gütesiegel Naturtextil"

Source: www.naturtextil.de by IVN

The *Gütesiegel Naturtextil* is the most ambitious textile seal. It is the first independent and common seal for product chain optimised eco-textiles, developed by the major players in the natural textile industry. IVN developed criteria for two labels which certify products along their whole product chain. They are divided into the categories "Better" and "Best". (Figure 8) At the end of 2001 1350 products were labelled with a "Better" or "Best" seal.

[8] Textile labels in Germany:
TOXPROOF; SG, schadstoffgeprüft; TÜV-Umweltsiegel; Auf Schadstoffe geprüft; Baumwollzeichen; Eco Proof; EU-Umweltzeichen "Euroblume"; Green cotton; Gütesiegel "Naturtextil"; Oeco-tex Standard 100; Wollsiegel; UV Standard 801; TÜV Rheinland Proof – UV-Schutz geprüft UPF

Source: www.lable-online.de by Verbraucher Initiative

The audit for a "Better/Best" seal is quite costly. So many producers who already fulfil the criteria shy the effort to label their new collections twice a year.

Figure 9: Oeco-Tex Standard100

As mentioned before, the seal with the highest market share is the *Oeco-Tex Standard 100*. The criteria focus on human toxic aspects only, Figure 9 gives some more information.

Box 4: The "Oeco-Tex Standard 100"

To develop the Oeco-Tex Standard 100 the Oeco-Tex Association followed the principle of Human Ecology. The criteria can be analysed in the textile pieces, so that all aspects involved in the international market are dealt with. This is in line with the requirement to control harmful substances.

Products certified according to Oeco-Tex Standard 100 can be marked with a label. It is an internationally registered mark ® and patented. An applicant is only entitled to use it if an Oeco-Tex institute grants the authorisation.

On the basis of *Oeko-Tex Standard 100,* a label *Oeko-Tex Standard 1000* is meanwhile being developed. It labels companies along the textile chain producing in an environmentally sound way and takes into account the criteria of production ecology. By January 2002, 24 holders of an *Oeco-tex Standard 1000* certificate were registered. Most of them were making-up and finishing plants. (Oeco-Tex) clothes which are produced entirely in plants with an *Oeco-Tex 1000* certificate and which fulfil the criteria of the *Oeco-Tex Standard 100* can be labelled with a *Oeco-Tex 100+* seal.

Finally there is also the so-called *Flower Label* of the European Union that seals textiles. The concept of the Flower Label programme is to support the best third of the market and so to eliminate worst practice. For textiles it tries to combine human ecology and production ecology criteria. So far, the Flower Label has not been accepted on the German market.

3.1.3.2 Demand Side

Shifting the focus of concern from the reduction of emissions to resource consumption, from industrial chimneys towards the sales point, also means changing the role of households from being *a victim* of environment hazards to being *a cause* of environmental degradation. This growing attribution of environmental responsibility to households calls for their empowerment as stakeholders, in particular by equipping them with reliable information and meaningful indicators about the resource intensity of the goods and services in supply. Providing this kind of simplified, directionally secure and transparent information for the consumer could be instrumental in activating the power of demand-side environmentalism. (Lorek 2001a) While a lot of tools are developed the households still don't recognise or use them. (Kuckartz, 2000)

As most fashion is produced outside Germany, consumers step into the gap of problem awareness. They confine their attention to the aspect of how they are affected by hazardous, toxic or allergic substances in their clothing and neglect that they are causing environmental problems elsewhere via their consumption decision. The same holds for social aspects. As is the case with most issues, not only in the field of sustainability, public awareness depends on scandals, campaigns by Non-Governmental Organisations, and political debates. But this aspect of consumer activity of acting as concerned citizens has also weakened during the last years. (see 0)

On the consumer side, the ecological criteria of clothing had a promising significance in the beginning of the nineties. (Weller 2000) It was triggered by studies and articles about harmful substances in textiles causing allergic diseases. In 1997 the *Federal Environmental Agency (UBA)* reckoned that the price was the main obstacle to eco-textiles becoming a mass product as consumers with a low budget are not able to transfer ecological knowledge into ecological behaviour. (Federal Environmental Agency (UBA) 1997, p. 215) This estimation was not wrong but too optimistic regarding the willingness of consumers to change their clothing habits. Instead, this discussion has lost importance over the last few years, and therefore consumers' attention. This is partly for a good reason. With the *Oeco-Tex Standard 100* the consumers' main concern, their own health, was eased. On the other hand, the ambitions and benefits of production optimised eco-textiles failed to reach higher levels of attention. As they are mostly not visible or perceptible for the individual consumers, they are not interested in paying the higher prices for the same personal benefit. (Balzer 2000, p. 366)

Market analyses about relevant criteria for cloth demand show quality (91 percent), price (83 percent), and skin friendliness (80 percent) to be the most important aspects. The attributes 100 percent natural fibre (40 percent) or environmentally friendly production (44 percent) were only mentioned half as often. (GfK – Textilmarktforschung 1999) Questions about spontaneous

association with the term "eco-textiles" showed quite clearly that eco-textiles were not viewed positively by the majority of consumers. A higher price, a lack of credibility and lack of fashion were the main points of disapproval. (Götz 1999) Consumers with a general interest in eco-textiles criticise the limited supply parochially to the mail-order trade. (GfK – Textilmarktforschung 1999)

The results of the GfK study were confirmed by a study of the research project "From niche market to mass market for eco-textiles" of the *Federal Ministry of Science (BMBF)* done at the *University of Oldenburg*. They recognised that, in the consumer's mind, eco-textiles are formless, without fashion and colour, boring, and much too expensive.

Considering that, for an increase in the eco-textile market the consumers are more a hindrance than promoters of change.

3.1.4 Attitudes and Cultural Impacts

Fashion is an important aspect of everyday life that can be analysed from the social, psychological, cultural and several other points of view. It is omnipresent not only in shop windows and magazines but as an issue of interest at parties or other societal meetings, and even as a relevant subject for the main news when the "Haute Couture" has its fashion shows in the Italian or French centres of fashion.

The world of fashion is full of positive emotions. Beautiful people in a good mood dominate the catalogue pages. Compared to that information about environmental relevance of product decisions is not even boring: it merely distracts consumers' attention. Fischer/Meyer compares it with the interruption of a romantic love story by the latest divorce rates. Information appealing to the rationality of consumers does not increase the attention and activity of customers but increases prejudice and even aversions to eco-textiles. (Fischer 2002)

Rapid changes in fashion increase the demand for clothes. Physical compulsion is usually the least important reason for new clothes. New clothing is produced and old, still usable garments are discarded. Even without changes in fashion, seasonal trends and the habit of consuming force people to buy new clothes. It is a common social attitude to feel that it is not appropriate to wear the same shirt for more than one year, since it is culturally obsolescent. (Vezzoli, 1998)

Provisional results from the three-year research project "From niche market to mass market for eco-textiles" suggest an "understatement of eco-marketing" as a possible solution. Thus eco-aspects are no longer a main argument for this special type of clothing but relevant information should be integrated into normal product advertising as much as possible. This way an additional benefit can be offered beside the attributes the consumer desires. For conventional mail-order traders

that would mean avoiding special eco-pages, instead integrating eco-friendly products into the catalogue as a whole. A suitable way to realise this is having eco-labels flanking other product information. Even if eco-labels are still not familiar to the majority of consumers, they could help show eco-benefits in a compromise form. Of course, the best results here could be achieved if there were a common label. (Fischer 2002)

3.1.5 Overcoming the Barriers

The market for eco-textiles is mainly influenced by the attitudes of the consumers. Usually, they are not interested in eco-textiles and associate them with negative assumptions. In addition, the price is an important (but often faked) argument.

To develop the eco-textile market, the most important and crucial task will be to reduce the negative influence that values and attitudes have on the demand side of the market. Therefore, eco-textile supply should avoid struggling against the negative assumptions of their products but sell them on the market with the attributes of fashion.[9] In this way, a new and positive impression of eco-textiles can develop in consumers' attitudes.

Furthermore, it seems necessary to initiate concerted action among all relevant stakeholders within the market to develop a common seal for clear and reliable communication towards the consumers and rules for accompanying documents to guarantee a better control of the product chain. These voluntary agreements should be strengthened by flanking measures of the legal framework. Politics and government can take a monitoring role but should also use their opportunities to raise the issue within the international debate.

On the basis of a deficit analysis, the Enquete Commission of the German Bundestag – among others – announced in 1993 the following recommendations for action on the supply side:

- an initiative for the development of international minimal standards "Good practices of growing natural fibres" (GAN) (OECD as well as GATT/WTO),
- support for the development of an "EU environmental label for textiles/eco-label" (introduction of material specific and production specific demands),
- creation of incentives for the voluntary installation of a "mediator of information in the textile chain" (InteK) for the further development of existing initiatives concerning the protection of environment and health,

[9] Migros recommend that customers should be offered a broad variety of goods that are produced with respect to the human being and the environment. This should be independent of awareness and the purse. http://www.migros.com./Migros_DE/Content/ModeSchoenheit/ (own translation)

- promotion of new methods of production and products that help increase the efficiency of material and energy (integrated environmental protection),
- support of research along the textile chain to reduce the current information deficit; a deeper consolidation of those fibres (especially flax as a regenerative home-based resource) and steps of the textile chain (especially the secondary chains) which have so far not been intensively treated by the Enquete Commission is recommended, and
- dissemination of information that is relevant to questions concerning environment and health to help customers make conscious purchasing decisions.

These recommendations still have to be transferred into concrete measures of consumer policy in order to achieve a significant demand for environmentally friendly textile products.

From the demand side, four chief barriers can be identified that limit the market potential for eco-textiles for the time being

- negative assumptions about eco-textiles dominate the opinion of the consumer majority,
- consumers have to accept tecological or social criterias without a personal benefit,
- they must be willing to pay a higher price and
- consumption habits must include shopping by mail order.

Textile retailers are seen as the most important players in overcoming these barriers. On the one hand, they can demand ecological criteria during the production process. On the other it is their challenge to offer the additional benefits of eco-textiles to the consumers. Their initiative should be given active government support (Bund für Umwelt und Naturschutz 2000)

From the cost side, reductions are necessary. This can be reached mainly via greater efficiency through a common and standardised supply chain management. One option for price reductions could be to increase the market and thus reduce costs at all levels of production. (Balzer 2000, p. 369) On the other hand the potential for greater demand by customers of high-price fashion are widely unused. Given the premise of being fashionable and available at the traditional point of sales, these consumers could be open to support suppliers with ecological responsibility. (Weller 2000)

To attract consumers' attention and reduce prejudice, first of all, greater improvement in product quality is essential as well as a more fashionable design

(eco-friendly colours, ecological improvement in synthetic fibres). A new and fashionable look of eco-clothes has to go hand in hand with a change in communication strategies. Information is an important tool in developing eco-textiles from a niche market into a mass market. Consumers need clear, easy and reliable information about the products. Consumers not only have a right to choose: they have the right to know what they are choosing. This requires all agents – particularly governments and industry – to work together to ensure that the right information is available to consumers. (UNEP, 2001) To create transparency, an independent and common label is needed that has been developed and supported by all stakeholders on the eco-textile market and accepted and used by all suppliers. Even if development were on a voluntary basis, government would still have to play an important role acting as a mediator and pushing the idea of a more sustainable textile chain within the international discussions.

An additional possible instrument could be an accompanying document with detailed information about auxiliary materials to open transparency along the textile chain and to enable shop assistants to give qualified information to customers. (Federal Environmental Agency (UBA) 1997, p. 211) From the producer to the salesperson, detailed accompanying documents can improve transparency within the textile chain.

Part of an information strategy will be the better qualification of merchants (Balzer 2000, p. 365). Retailers – mainly mail-order traders – can also spread qualified information after purchase. That could be congratulation letters for deciding on a product with special eco-quality, for example. (Fischer 2002) A handicap for more, qualified and better information is that most retailers of eco-fashion lack an adequate advertising budget. (Weller 2000)

Finally, NGO's play an important role for more and better information. They are reliable sources for awakening consumers' awareness of their individual responsibility and possibilities. The following example of the T-shirt shows that it is easy to give consumers a notion of the complexity of the textile chain.

Figure 10: Production steps of a T-shirt and transport distances between them

Besides the environmental necessities, more and more societal groups are critical of the social production conditions of the textile chain. Thus, calls for greater justice are an increasingly powerful tool to rethinking textile production and consumption. Besides information and campaigns, NGO's are also starting practical activities to demonstrate that sustainable clothes production is possible. For example, the *Katholische Landjugendbewegung KLJB* developed the *LAMULAMU* collection of organically grown cotton clothing produced in a social certified product chain. (Haferkamp, 1998 ; Hansen, 2001)

Also, commercial actors on the eco-textile market such as *Migros, Karstadt/ Neckermann/Hess Natur* (as parts of the same group) or the *IVN* have already started to link both these aspects of sustainability towards a common concept in negotiations with the *Clean Cloth Campaign*.

3.2 Green Power

More efficient use of energy is a critical aspect of achieving sustainable consumption. In Germany per capita energy use is over 170,000 MJ. Compared to a 62,000 MJ world average, this figure is very high. From the aspect of efficiency, the picture differs. The specific energy consumption per unit GDP in Germany is only one third compared to the world average. (BMWi 2000)

Germany's primary energy consumption is covered mainly by 5 energy carriers. The most important one is mineral oil (about 40 percent). It is followed by a steadily increasing share of natural gas, which came up from 15 percent in 1990 to 21 percent in 1999. Coal, brown coal and nuclear energy had very similar volumes, ranging from 11 to 13 percent in 1999. While coal came down from 15 percent and brown coal from 21 percent quite quickly in the nineties, the share of nuclear energy increased. Wind and water power and other carriers of renewable energy are growing, but they are still marginal.

Table 3: Share of energy carrier of primary energy consumption in % and PJ

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Mineral oil	35.1	38.0	39.3	40.2	40.1	39.9	39.4	39.5	39.9	39.4	38,3	38,3	37,5
Natural gas	15.5	16.6	16.8	17.7	18.3	19.8	21.4	20.7	21.1	21.5	21,1	21,6	21,7
Coal	15.5	15.9	15.3	15.0	15.1	14.4	14.2	14.0	14.1	13.3	14,0	13,1	13,2
Brown coal	21.5	17.2	15.2	13.9	13.1	12.2	11.4	10.9	10.5	10.3	10,8	11,2	11,6
Nuclear energy	11.2	11.0	12.1	11.7	11.6	11.8	12.0	12.8	12.2	13.0	12,9	12,8	12,6
Water and wind craft	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0,7	0,8	0,9
Others*	0.9	0.9	0.8	1.1	1.3	1.4	1.2	1.6	1.7	1.7	2,2	2,2	2,5
Total in PJ	14912	14610	14314	14305	14182	14270	14745	14572	14461	14194	14345	14589	14319

Source: Arbeitsgemeinschaft Energiebilanzen * Solar, Waste, Wood, Import 1 PJ (Petajoule) = 1,015 Joule

For electricity production, nuclear energy, coal, and brown coal are the most important sources with a share of nearly 90 percent. These three energy carriers cover the base load of German energy demand. Oil and gas powered power plants – holding a share of 10 percent together – are normally used in times of high electricity demand. Comparable with the general trend, increasing preference is given to natural gas. At under 2 percent, the share of renewable resources for electricity production is rather low. (Table 4)

Table 4: Structure of energy carriers for electricity production in %

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Coal	23.4	25.5	24.5	25.8	25.6	26.0	26.0	24.6	26.3	24.6	24,1
Brown coal	33.2	31.6	30.7	29.9	29.5	28.1	27.3	26.6	26.0	25.7	27,0
Other solid fuel	1.2	1.2	1.3	1.3	1.4	1.3	1.2	1.3	1.4	1.5	1,8
Mineral oil	2.0	2.4	2.1	1.6	1.5	1.4	1.5	1.0	0.9	0.7	0,7
Gases	8.0	7.8	7.0	7.1	8.0	8.6	8.6	9.4	9.7	9.8	8,7
Natural gas	6.2	6.1	5.3	5.6	6.4	6.7	7.1	7.3	7.6	7.7	7,0
Water/ wind	1.4	1.3	1.5	1.6	1.6	1.8	1.8	1.6	1.7	1.8	2,6
Nuclear energy	30.8	30.2	32.9	32.7	32.4	32.8	33.6	35.5	34.1	35.9	35,1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Arbeitsgemeinschaft Energiebilanzen

3.2.1 Environmental Relevance

Nearly every kind of energy production has a negative impact on the environment. The use of nuclear energy carriers creates radioactive waste with serious problems of safe storage. The burning of fossil energy carriers – coal, mineral oil, gas, etc. – leads to emissions of CO_2, SO_2, and NO_X. While the latter two can be reduced by technical solutions, CO_2 emissions from burning cannot be prevented and therefore play a crucial role in global warming. (Lorek 2001c) With the adoption of the *Kyoto Protocol,* the German government committed itself to a reduction of greenhouse gas emissions of 5 percent of the 1990 level by 2012. Germany's internal targets are more ambitious. (Oberthür, 1999)

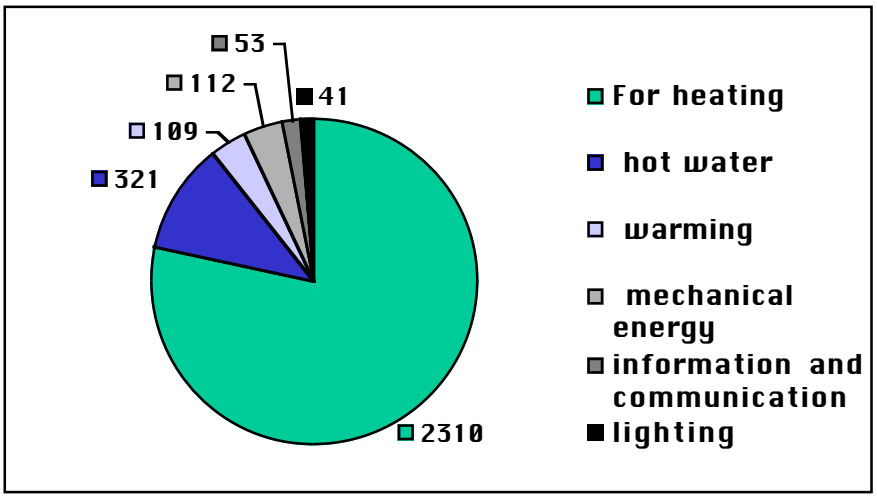
Besides an overall reduction of energy consumption and greater energy efficiency, renewable energy carriers are of considerable importance in the reduction of CO_2 emissions. Depending on the method of accounting they avoided 20.4 million t (13.3 million t) in the electricity sector and 4.3 million t in the market for heating in 1998. All in all this is 2.9 percent (2.1 percent) of the total CO_2 emissions. Compared to the market share of renewables (see 0), this is a significantly higher contribution. (Staiß 2000, pp. I-10)

Relevance of household activities

German statistics distinguish five different final energy consumers: industry, traffic, small businesses, households, and the military. In 1999 figures, households have a share of 28.5 percent of final energy consumption. About one fourth is demanded by industry. Traffic has nearly 30 percent, and, finally, small businesses have a share of 16 percent of final energy consumption. The military is below one percent. The household consumption of 2,601 PJ (in 1999) is a share of 18.7 percent of the 14,194 PJ of primary energy consumption.

Energy is used for different purposes in households, predominantly for space heating with shares of some 75 to 80 percent. This is followed by energy used to heat water and to provide power or meet other daily heating needs such as cooking. The energy applied for lighting lags far behind, bringing up the rear. Information/communication and lighting add up to only little more than 3 percent of household energy consumption. If the use of the private car is taken into account, heating and car driving consume 85 percent of household energy and information/communication and lighting drop to 1 percent each. (Figure 11)

Figure 11: Household energy consumption for different purposes in PJ



Source: Vereinigung Deutscher Elektrizitätswerke

Taking into account the immense share of energy used for heating it should be on the top of the list of priorities concerning environmental pollution through household energy consumption. (Lorek 2001c)

On the other hand, substituting 1 kWh electricity from fossil sources with 1 kWh from renewables can avoid 0.89 kg CO_2 compared to the saving potential in the heating sector of 0.29 kg CO_2 per kWh. (Staiß 2000) So, when focusing on the demand for renewable energy, the contribution of heating energy and electricity are both important aspects for the reduction of environmental pollution.

3.2.2 Legal Framework

Until recently, it was mainly government support that pushed the development of renewable energies. (Federal Environmental Ministry (BMU) 1999) The political conditions which are still required to promote the expansion and efficiency of renewable energies were significantly expanded in 2000. The following activities are relevant for households.

The *Renewable Energies Source Act* (Erneuerbare-Energien-Gesetz, EEG), which entered into force in April 2000, guarantees a minimum premium to operators of renewable energy-charged power plants for each kilowatt hour of electricity input into the public grid. The minimum premium for the input of electricity generated by water power is min. 7.67 cents, in wind power plants it is 6.19 to 9.10 cents per kilowatt hour (kWh), up to 10.23 cents for biomass and 50.6 cents per kWh for solar power fed into the grid. This makes investment in renewable energy systems more attractive. The costs of these premiums are divided among electricity customers by a special calculation system. (Staiß, 2000 http://www.solarserver.de/solarmagazin/eeg.html)

The so-called *100,000 Roofs Programme* aims to promote the installation of 100,000 photovoltaic plants up to the end of 2004. While the fund was not exhausted in 1999, it was requested very intensively in 2000. In 2001 the funding bodies granted 20,000 plants, six times as many as in 1999. (UVS) This led to a change in the programme's conditions and a reduction in the foreseen running time. Individuals, as well as small and medium-sized enterprises are entitled to apply for the money. (Neu 2000)

In September 1999 the *Programme to Promote the Use of Renewable Energy* was started. It is called the *200 Million DM Programme* as it offers 100 million EUR each year up to 2003. Support is via a subsidy or auspiciously credits.

In addition to these federal programmes the Länder also offer a wide range of financial support. From 1991 to 1997, the Länder spent 1.4 billion EUR on the promotion of renewable energy.

Last but not least, private programmes exist that are supported, for example, by the regional energy suppliers or the nation-wide initiative *Solar 2000*.

The best experience with the acceptance of these programmes has been made with subsidies. Loans were found to be less effective. (ZSW)

Targets

From the angle of sustainability, the main target of (household) energy consumption is to reduce environmental impacts. Obviously, this should be achieved by a reduction of energy consumption. In the sense of this study, it means substituting fossil energy with renewables. That can be measured by the increase in the market share of environmentally friendly renewable energies.

According to the *Renewable Energy Source Act* the target is to reach a market share of 10 percent electricity production from renewables by 2010. In the long run the Federal Ministry of the Environment plans to increase renewable energy

up to a market share of 50 percent in 2050, which means 10 percent per decade. With the technologies available, 60 percent of primary energy demand could be covered with renewables. (Staiß 2000, pp. I-172)

Such supportive policy could be most effective where a combination of different policy tools comes into action (Wuppertal Institute 2002), likewise:

- An agreed or mandated, quantified target for energy savings,
- A channel or an allowance for raising funding and for avoiding net economic losses in a way not discriminating between companies, and
- A standardised and mandatory scheme for cost-benefit evaluation of the energy efficiency activities.

3.2.3 Market Analysis

To fulfil their energy demand, households have to deal on different markets. The most common markets are the ones for heating oil, natural gas and finally the electricity market. Additionally, in recent years, and increasingly in the future, there is a fourth market for renewable energy. While the only option for environmentally friendly behaviour in the traditional three markets is to reduce the consumption of the energy carrier, the new market offers two other options to reduce environmental pollution, e.g. CO_2 emissions. Households can decide to buy renewable energy and/or they can produce energy from renewable sources themselves. In the one or other way they shift demand from the fossil energy carriers and push the market for renewables.

According to the 2000 Yearbook of Renewable Energies the market share of renewable energies in Germany is 1.1 percent of primary energy use.[10]

For electricity production the share of renewables is 4.5 percent. About 75 percent is from hydro power and 20 percent from wind energy. In particular, wind energy has developed dramatically during the last 10 years, growing from 40 GWh in 1990 to 5,400 GWh in 1999. This is more than 100 times as much. Nevertheless, the share of wind power in the electricity market is still only 0.9 percent. Biomass and photovoltaics are even less important in the electricity mix, at 0.2 and 0.008 percent respectively. (Staiß 2000, p. I-3)

Generators of electricity from renewable energy either have the choice of feeding their product into the grid of the regional grid owner and getting a fixed minimum amount of money per kWh – depending on the source – or they can sell the electricity directly to the customers, at least in theory. Up to now, it is not guaranteed that both possibilities of refunding energy production are used in

[10] If measured according to the efficiency methodology. It is 2 percent in other sources referring to the substitution methodology.

parallel. However, this explains the difference between the share of electricity production from renewables with 4.5 percent and the market share of sold green power. The share of consumers buying green power was about 0.5 percent in 1999 or less than 200,000 of the 40 million customers.

The collector area of solar thermal plants is 2.6 million m^2, eight times higher in 1999 than in 1990. However, this is only 6.1 percent of the renewable energies used for heating. The largest share (85 percent) is from solid biomass. Geo thermal (5.1 percent) and biogas (3.8 percent) complete the range. In the heating market, renewables have a share of only 1 percent. Within the heating market, solar power covers 0.061 percent of heating demand. (Staiß 2000, P. I-6)

3.2.3.1 Supply Side

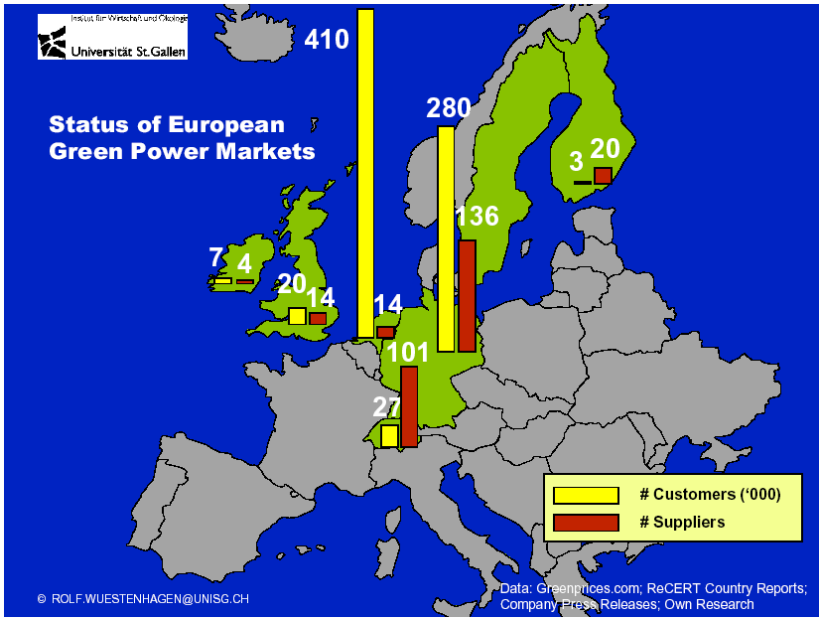
Green power
Green power has been part of the electricity power supply for the last few years and it was paid for by cost-covering buy-back tariffs and ecology tariffs by some regional utilities. Since the liberalisation of the electricity market in March 1998, more and more regional and municipal utilities have been established. Also, a growing number of new companies specialised in green energy are offering electricity from renewable energy sources. In February 1999 about 50 enterprises offered tariffs and contracts that were related to green power. Twenty more were expected during the following month. (Federal Ministry of the Environment (BMU) 1999)

Meanwhile electricity markets offer more then 200 possibilities to buy green energy. (ZSW) Today, the market of local and regional suppliers is quite confusing.

The supply of green power is either from renewable energy carriers only or from a mixture of renewable energy and combined heat and power plants (CHP) with 50 percent CHP maximum. (Staiß 2000, p. I 117).

In early 2000 the market leader was Natur Energie AG. They have been selling green power as the standard tariff for all of their customers since December 1999. These figures can hardly be compared with other eco-providers as no consumer decision was necessary to get green power. Other important players are RWE Energy AG with 15,000 clients within the eco-tariff (1 percent of their total customers) and the newcomers Greenpeace energy eG with 7,200 customers and Naturstrom AG with more than 5,000 clients. (All data from early 2000; Staiß, 2000, pp. I-120). Figure 12 gives an overview of suppliers and customers of green power in selected European countries.

Figure 12: European Green Power Markets



Source: Wüstenhagen (2001)

Compared to the common prices the production of green power is more expensive. How much does this depend on the production mix? It differs from a very low margin for electricity from hydro power up to 1 EUR per kWh for solar energy. So most providers either offer an adequate mix of renewable energy sources to avoid unacceptable prices or cover only a part of the electricity demand with green power. (Staiß 2000 p. I-118)

Suppliers of green energy are not forced to verify their offers of green power with an independent label. Indeed there are no binding criteria for green power so far.

Labels

A key element for an increased market share of green power is consumer confidence. In parallel with the growth of the market for green energy, the need for verifying the origin and the quality of the electricity has led to the development of several certificates with criteria for different target levels. The most important of them are developed and controlled by independent environmental NGO's, consumer associations and independent institutes. The criteria of these certificates are sometimes adjusted to the rapid changes in the dynamic market and depend on the energy-political intentions of the certifying bodies. With households' decision to buy certified green energy, a change towards environmentally friendly power generation is made because new systems can be installed with the surplus of the eco-tariffs. (Lorek 2001c)

The three most important labels are described below.

Figure 13: German green power label

Source: www.lable-online.de ; www.lichtblick.de

The *Grüner Strom Label* is the most ambitious label in Germany so far. The criteria that have to be complied with to obtain the 'gold' or 'silver' label from *Grüner Strom Label e.V.* have been developed under the patronage of *Eurosolar* and several environmental associations (e.g. *BUND, Nabu, Bund der Energieverbraucher,* etc.). Both the 'gold' and the 'silver' labels are adapted according to the background conditions that have changed slightly since the introduction of the EEG (renewable energy law) in April 2000.

The main focus of the label is to improve the environment. This means in detail that only those green energy products will be labelled that invest in plants that need subsidies at the moment but will be profitable in the future. This criterion as well as the ones mentioned below will be checked once a year.

As sources for green energy, only the following ones are accepted: solar radiation (PV), wind energy, hydropower, biomass, gas from purification plants, landfill gas and geothermal energy.

The label is only granted to those green energy products that are based on the so-called "Zuschussmodell *(Fondsmodell)"*, which means that the customer pays an additional fee on top of his regular price per kWh. The supplier assures that he will invest the additional fee after subtracting some costs for administration to set up new renewable power plants.

This criterion is the basis for the distinction between a 'gold' and a 'silver' label. If the supplier invests more than 2 cents per kWh of the additional fee, generated by a green energy product in new renewable energy plants, the 'gold' label is granted. Is the amount between 1–2 cents per kWh, then the product is awarded the 'silver' label.

Additionally he guarantees that the power he uses to supply his green energy customers is produced in plants that feed into his grid.

Besides these requirements concerning the green energy product, the *Grüner Strom Label e.V.* also makes some requirements regarding the supplier, who is not allowed to own nuclear power plants or act negatively towards renewable energy. (http://www.greenprices.com/de/certinfo.asp?cid=5)

The association of the *Technische Uberwachungsvereine (TÜV)* developed the *Standard VdTÜV 1303*, which is used by all *Technische Uberwachungsvereine* in Germany for the certification of electricity generated 100 percent by renewable energy sources. In the *VdTÜV 1303 standard,* the following sources are accepted as renewable energy: landfill gas, biomass, geothermal prospecting, hydropower, wind energy and solar power. Power produced by renewable energy sources has to refer to clearly described and identifiable sources. In addition it is required that a 'significant portion of the profits from the sales of the certified electricity' is to be invested in new systems.

The TÜV Süd goes further. In addition to the VdTÜV 1303 standard, it distinguishes between four standards. First there is a distinction between environmentally friendly energy (UE) and renewable energy (EE). Concerning (EE), the TÜV prescribes a production of power out of 100 percent renewable sources. Concerning (UE), the TÜV allows a maximum of 50 percent of combined heat and power (CHP).

The label distinguishes between two further categories: partial and total coverage of supply. In this case, partial coverage means that the same amount of electricity that has been bought by the user has been generated from renewables by the end of the year. Full coverage guarantees that at any given hour, the supply from renewables equals the demand of the users. (http://www.greenprices.com/de/certinfo.asp?cid=6)

The *ok POWER* criteria were developed by the *Ökoinstitut e.V.* in cooperation with the *WWF Germany* and the *Verbraucher Zentrale Nordrhein Westfalen*. They are used for awarding the certificate and for updating it according to the new circumstances, based on the fact that the renewable energy law is coming into effect.

At the centre of the criteria is the guarantee that certified products are really contributing to an improvement in environmental conditions. Therefore the supplier is forced to set up new power plants that are based on the use of renewable energies.

The certificate is made for two different kinds of green energy products.

The so-called “Händlermodelle”: In this case the customer is supplied with green energy as stated in the contract. Two thirds of the delivered power must be produced in power plants that are not older than three years. These plants are to be out of the range of subsidies granted by the renewable energy law.

The so-called “Fonds- oder Zuschussmodelle”: The customer is supplied with the same power as before, but in this case renewable energy is promoted by an additional amount of money being paid which is used for setting up new power plants that are using renewable energy sources. In this case, the certificate regulates the use of the money and defines the minimum requirements on the effects of such products. In addition the supplier is forced to inform the customers on the quality of the power delivered.

Further criteria are that the producers of green energy support the building of new plants that make use of renewable energy according to prescribed rules. Additionally it has to be proved that the installed plants using renewable energy would not have been installed without this promotion. Furthermore it has to be proved that in financing these plants, supply has not shifted from the public to some single green energy customers. (http://www.greenprices.com/de/certinfo.asp?cid=14)

To win market shares with green power requires entrepreneurial commitment. Green Power Marketing is no longer seen just as a matter of image-building, but rather as a strategic necessity – where customer-oriented implementation necessitates the targeted use of all marketing instruments. (Figure)

Figure 14: Green power marketing mix

http://www.greenpowermarketing.org/deutsch/index2.html

Renewable energy plants for private consumers
Industry offers several systems to cover parts of household energy demand directly via small renewable energy plants. Solar thermal and photovoltaic plants are the most important systems for the demand. Both of them use solar energy.

The solar thermal plants are used to heat water. So they reduce the energy use for the hot water supply of bath, shower, and kitchen appliances. Advanced plants also support the heating system. The market for solar thermal plants has risen significantly over the last decade. The new collector area installed yearly increased from 50,000 m^2 to 420,000 m^2 from 1990 to 1999. This is a growth rate of 24 percent on average. The most common systems are for hot water only (5 to 10 m^2 collector area). Among newly installed plants about 20 percent are also useable to support the heating system. They are a bit larger (8 to 15 m^2) and have bigger water storage. (Staiß, 2000) In 2001, additionally, over 100,000 solar thermal plants were installed, 10 percent more than in 2000. In spring 2003 solar thermal plants were installed on the roofs of over 500,000 household and demand is still increasing. (UVS)

Photovoltaics (PV) is a technology for the direct generation of electricity from sunlight. It has become increasingly widespread in Europe over the last decade. At the end of 1998, Europe held about 14 percent of the world-wide photovoltaic capacity. Germany alone had 46 percent of the capacity in Europe or 10 percent world-wide. Out of the 65 MW installed capacity in 1999, 2,200 plants or 30 percent were from small private plants with a capacity below 5 kWp. (Staiß, 2000) In 2001 the number of photovoltaic plants increased by about 130,000. (UVS)

3.2.3.2 Demand Side

Green power
Since 1998, the electricity market has been open for households. They can now decide if they will stay with their local supplier or take another one. While some households use this opportunity to buy electricity from the cheapest sources, others opt for companies with special offers for renewable energy. Consumer organisations criticise that important conditions for real competition are not fulfilled (confusing contract modality, un-clarified conditions for change, etc.) and recommend regulatory administration. (AGV, 1999) Private consumers have taken advantage of their new role only to a small extent so far. Changes towards cheaper suppliers are expected to be 3 percent. Changes towards green energy suppliers or tariffs are even less, about 1 percent.

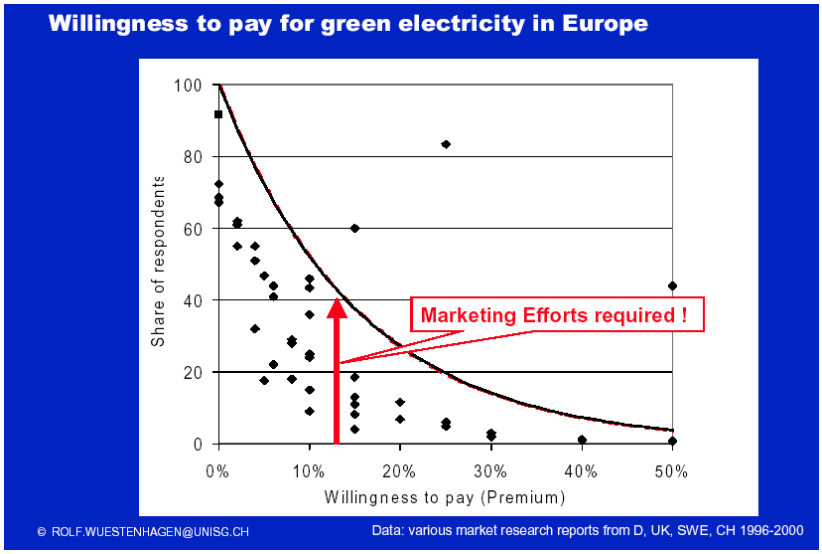
Many of those who have tried to change their supplier have encountered lots of problems. These problems comprise announced or actual refusal of access to the local grid for a newcomer to supply, non-existing or unfair terms of the contract for new customers, lack of notice whether and when the change in supply would happen, new sellers that have flopped (who may have been paid a deposit or a first rate already) ending with (sporadic) threats to cut off the electricity to those consumers wishing to change the supplier. (Meinel 2001) So the decision for green power is a two-step innovation for consumers. They have to recognise that it is possible to think about and to decide on the electricity provider in general and additionally they have to realise the differences, advantages and disadvantages between conventional and green power. (Wüstenhagen 2000)

Green power is demanded by energy clients for two reasons. One group wants to make sure their energy is from renewable sources without further interest in a development of the green energy market. The other group wants to push renewable energy supply with financial support. (Kuckartz 2000; Staiß 2000)

A summary of several European studies discovered that 60 to 80 percent of the customers are in favour of green power in general. And 50 to 70 percent even declare that they are willing to pay a higher price. (Staiß 2000, p. I-121) This demonstrates that the general idea of green power is well-accepted and has a positive image.

For further development, the potentials realisable within the household sector are estimated in different ranges. The yearbook of renewable energy sees the share of changing consumers to 2–4 percent within the next five years and up to 20 percent in the long run (20 years). (Staiß 2000, p. I-121) From surveys in several countries, Wüstenhagen summarises a market potential of 25 percent in the medium term and 50 percent in the long term. He separates the potential of willing consumers into different groups. The critical point seems to be the price. Wüstenhagen refers to psychological studies that identified a narrow potential group that is willing to pay a higher price and a broader potential group which is not sure about their willingness to pay more. Assuming the surplus for green power will stay in a range of 10 to 15 percent, a market potential of 20 to 30 percent seems to be realistic.

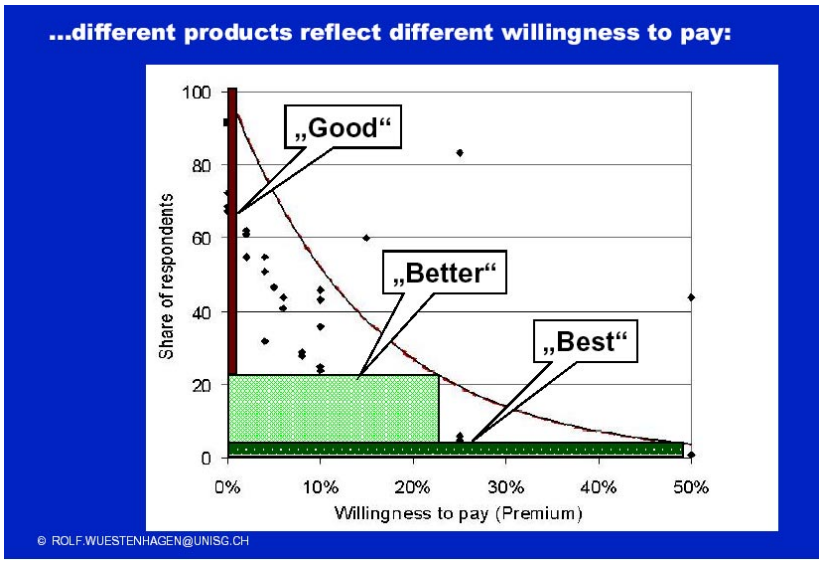
Figure 15: Willingness to pay an eco-premium



Source: (Wüstenhagen 2001)

A promising way to skim the willingness to pay is a differentiation between the eco-products along the lines of the silver and gold tariffs offered by the *Grüner Strom Label*.

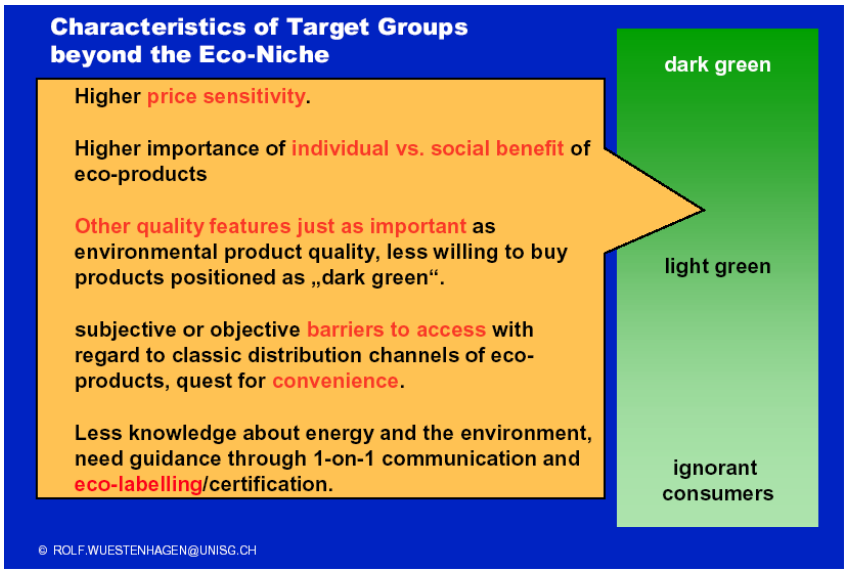
Figure 16: Willingness to pay for different degrees of product "quality"



Source: (Wüstenhagen 2001)

The most promising target groups are urban younger and middle-aged consumers with above-average education and income. (Wüstenhagen 2000) Figure 17 mentions five characteristics that have to be considered when enterprises want to reach the takeoff segment of consumers.

Figure 17: Characteristics of target groups beyond the eco-niche



Source: (Wüstenhagen 2001)

As can be recognised for most socially desirable activities (e.g. buying of ecological or fairly traded products), there is a considerable discrepancy between survey results about the idealistic support of green power and the real market share. Compared to the survey results, the realised participant share of 0 to 6 percent demonstrates the gap between statements and action. (Staiß 2000, p. I-121) Statements by consumers in such surveys neglect the complexity of the consumer decision-making process. They are based on mono-causal linkages between price and decision, lacking aspects such as access, transactions costs, supply safety, etc. And in fact, the supposed 20 percent have to be seen as the upper limit of market potential. Experience from electricity companies shows that campaigning among clients to choose their adequate electricity mix and tariff only reaches a minority. Among the few who responded to these campaigns in any way, only a very small percentage shifted their contract towards the green tariff. (Wüstenhagen 2000).

However, it is also true that the market potential is larger than the realised 1 percent.

Renewable energy plants

Private investors are already an important incentive towards renewable energy carriers for heating with about 150 million EUR Solar-thermal plants on the roof are the most common investments in new energy technology for households. Eighty percent of the installed collector area is demanded by private households. About 70,000 households opt for a solar thermal plant each year. This demonstrates the increasing interest in solar energy in general. (Staiß 2000,

p. I-51) Growth in demand for solar plants in recent years was based on several aspects. Besides the political framework conditions, the price of other energy carriers is an important aspect for households to opt for investments in renewable energy. Demand rose with rising prices for heating oil at the end of 2000, for example. (Staiß, 2000)

Heat pumps and biomass plants are further systems to cover household heating demand directly.

Photovoltaic plants offered an electric capacity of 50 GWh in 1999. Forty-five percent of them are in private ownership, and most of them are small plants (< 5 kWp). Thanks to the *Electricity Feed-in Law*, households get 0.50 cent for every kWh electricity they produce. However, this is still below production costs, at about 0.75 cent per kWh. The input into the public grid is measured directly after production, even if a part of produced energy is used for the private household afterwards.

Acceptance by private households of all governmental subsidy programmes is good for electricity as well as for heating. From the beginning of the P*rogramme to Promote the Use of Renewable Energy,* for example, to the end of 2000 over 113,000 applications for financial support were submitted, most of them, over 100,000, for solar energy plants or a combination of solar energy with energy modernisation. Experience suggests that over 70 percent of these applications will be granted. The public information centre for renewable energy programmes alone gets about 100 requests a day. (Lorek, 2001)

3.2.4 Attitudes and Cultural Impacts

Attributes of social standard are narrowly related to high energy consumption. They are mainly connected to big houses and/or the available square metres of living space. (Lorek, Spangenberg 2000) But that cannot conceal the fact that energy and, especially, electricity has always been a product of low interest in Germany. That has not changed up to date. German households (former Republic) spent a lower share of their income on energy in 1995 than in 1970. So any willingness of private consumers to change suppliers has only been developed very weakly so far. (Meinel 2001)

On the other hand – from the social point of view – houses with visible solar energy or photovoltaic plants can give prestige to their owners as well. This is mainly the case for upper middle class households with higher education. (VZ)

3.2.5 Overcoming the Barriers

The situation of the German green power market can be summarised as following:

There is strong governmental support for renewable energy (EEG). Several start-ups have already entered the green power market and some have already left. To verify the supply of renewables, three competing labelling/certification schemes exist but do not have to be used by the suppliers. Green power production and green power demand are not necessary linked. Even if green power demand is limited there is strong growth in renewable generation. These specific aspects of the green power market were imbedded in massive price erosion in the electricity market in 1999/2000 and an unclear regulatory framework that limits the possibilities and interest for switching the provider. (Wüstenhagen 2001) So the yearbook of renewable energy summarises that if the trend goes on at the given speed, the target of doubling the renewable energy quota will not be reached by 2010.

A cross-country comparison shows similar results, even if operators and the regulatory framework vary considerably. In most countries, green power is a niche product, and switching activity is generally low. Market penetration is broader in countries with environmentally aware consumers and/or with lower green power prices. The development of green power does not depend on liberalisation. Significant green power marketing activities are regarded both in regulated and fully liberalised markets. (Wüstenhagen 2001)

To overcome the obstacles of low market penetration a price differentiation is useful to increase profitability of the product range. Promotion should focus more on the individual consumer (1-to-1 marketing) in addition to mass marketing. A helpful tool for the right placement could be co-operation with retailers from other branches to bring the idea of switching to the public. (Wüstenhagen 2001)

To reach the *Renewable Energy Source Act* target of 10 percent market share of renewables for electricity production in 2010, the legal framework has to adopt additional measures. They should integrate

- monetary and regulatory instruments
- better information and training
- as well as further measures such as the promotion of research and marketing.

The crucial framing conditions are cost regression effects for renewable energies, a general rise in the market price for electricity and a price increase for fossil energy carriers. This can be achieved by eco-taxes or other instruments to internalise the external costs of CO_2 emissions, for example. (Staiß 2000, p. I-122) Furthermore the market rules for grid access have to be developed in a fair way.

Within the recommended mixes of instruments, only a few target the demand side of renewable energy.

When the demand side is affected, important aspects are (Federal Environmental Ministry (BMU) 1999):

- no energy tax on green power for the final consumer
- priority for green power regarding the entrance and the use of the grid
- priority of green power for public consumers to set a good example
- labelling/certification is important
- further grants for private investors beyond the year 2003 with 20 to 25 percent of the investment cost or with a fixed amount per m^2 collector area.

Generally, Wüstenhagen suggests: “Can you double renewable energy without involving the consumers? Then fine!” (Wüstenhagen 2001) This can be modified into: Can you double renewable energy without depending on market decisions of consumers? Then fine! But don’t forget people are not only consumers but also citizens. If green energy is funded via higher prices for all customers or via subsidies from the tax payers, political responses among the voters are possible.

The further diffusion of eco-efficient technologies and renewables, and their considerable implications for lower demand levels, shows evidence of social and cultural norms for energy policy. From this point of view the understanding of consumer expectations has to be changed: people do not consume energy, they consume services which make a “good life” possible. The supply of renewable generated power is only a necessary, not a sufficient, condition for an efficient allocation of resources. End-use energy is not the end product, but only an intermediate product. Final consumers do not benefit directly from final energy, but from genuine (physical) energy services, e.g. properly lit and heated rooms, “hot pizza and cold beer”. Therefore, these genuine energy services, not energy (“kilowatt hours”), have to be provided with as little damage to health and the environment. It is not sufficient to limit market reforms to only a part of the market by stopping at end-use energy.

Only the optimisation over all stages of the production process of genuine energy services leads to efficient allocation of genuine energy services. Thus, an integrated consideration of the market for the basic factors of production, the markets for primary, secondary and end-use energy, the market for energy efficiency technologies and services which are used to transform end-use energy into genuine energy services, and the market for genuine energy services itself is needed, paying attention to the interdependencies of the markets. (Wuppertal Institute et al., 2000)

4 Conclusions

This study presented a holistic view of the green textile and green power markets. The aim was to systemise the influences on sustainable consumption patterns. Reflecting on the two case studies, the following conclusions can be made.

4.1 Some Developing Aspects of the Green Textile Markets

Let us first take a look at the interplay between the supply and demand side of the textile markets. New ecological market initiatives for individual consumer goods – like in the textile and clothing sector – came first of all from critical consumers who informed the general public about health risks and fair trade aspects. These first initiatives were important for posing new questions about producers' accountability. These ethical discussions did not lead directly to relevant market volumes, but some small enterprises started to offer eco and fair-trade textiles. In the following decade those green suppliers played an active role by adding the aspect of human ecology to the general criteria of textile production. Textiles with reduced or minimised toxic residuum in the product quickly became a standard among the Goliaths and even reached the laggards. However, the much more ambitious approach of production ecology failed to reach the interests of the early adopters. As a consequence the Davids lost parts of their already small market share.

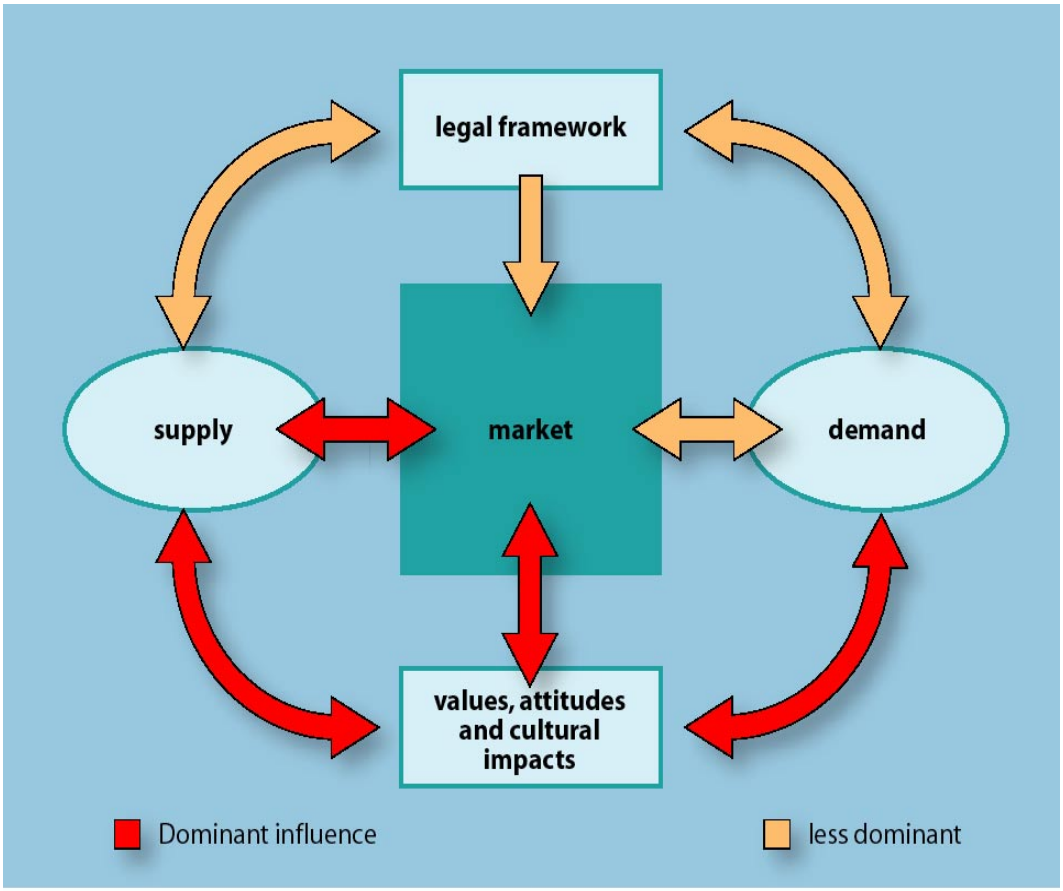
The strongest position of eco-textiles has been in mail-order trade. Here some of the Goliaths pushed the development. But, similar to the realities found in mail-order trade, the trend is towards selling eco-textiles without active marketing campaigns. Consumers are informed about the ecological features after the purchasing decision. It seems that eco-labels are less important as commercial and marketing tools than in the past. If environmental matters are to play an important role in the future development, it seems necessary to foster an integrated sustainable label which take environmental issues, labour conditions und fair-trade aspects into account.

Referring to the regulatory aspects it can be seen that besides demand and supply factors, other elements are essential for sustainable consumption in the green textile market. First of all it is obvious that the textile market is strongly influenced by general societal trends like individualisation and the so-called free-time society. There is a remarkable consumer trend to create different outfits for

every occasion. The modern consumer will primarily have other parameters in mind than the environment when choosing his outfit.

Clothes show whether someone is up to date and “hype”. These cultural, symbolic attitudes dominate the marketing strategies of the major retailers. To attract more public awareness to sustainable textile questions, it is necessary to connect sustainability criteria with the fashionably right garment and consumer satisfaction in general. From this point of view sustainability will probably be more an additional asset rather than a leading criteria of decision-making .

Figure 18: Forces driving textile market introduction



Source: Lorek, Lucas

Taking the targets of sustainable consumption, the strategy of developing eco-textile markets can only be a part of a bigger solution: changing the quality of material throughput will not solve the quantitative problems of a rising amount of textile rubbish and waste. But active promoters of a long-usage campaign for clothes could not be identified until now.

4.2 Some Regulatory Aspects of Green Power Markets

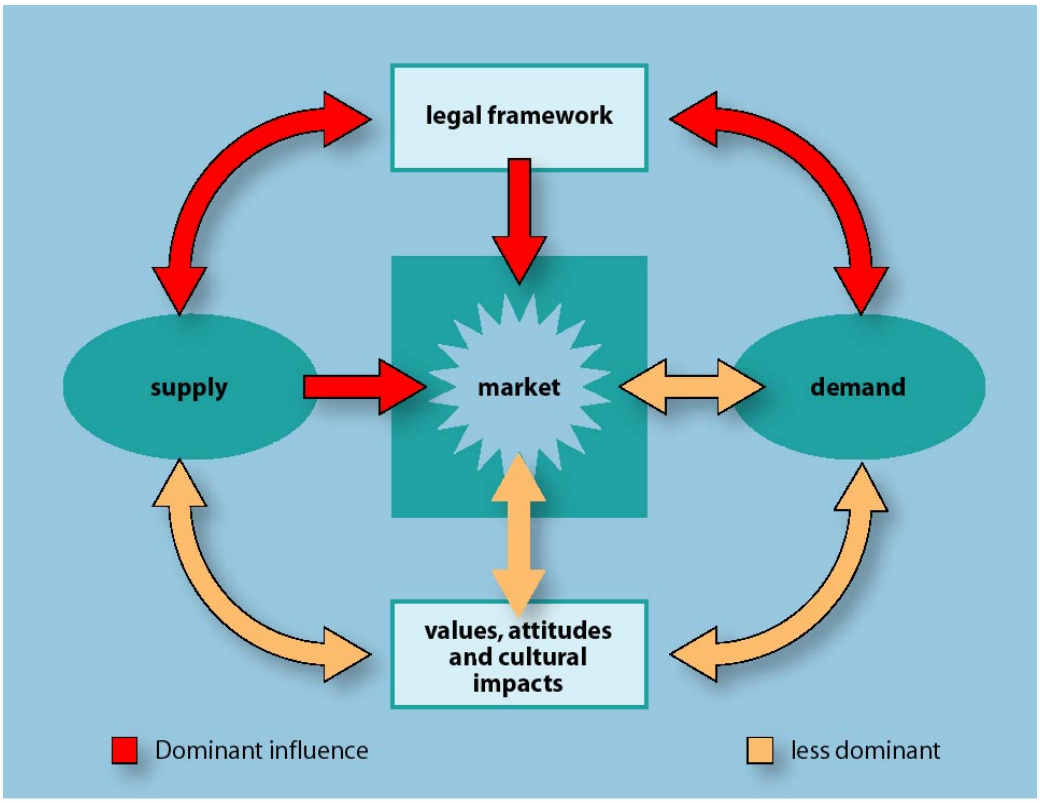
The current energy debate focuses on climate change, and the Kyoto Protocol. Therefore the energy policies are connected with targets to reduce greenhouse gas emissions. Thus the circumstances in the green energy market differ significantly from those in the textile market.

The green energy market is mainly dominated by political interests and decisions, not by the interactions of demand and supply in an independent market. The demand for green electricity was formulated by consumer interest groups (mainly environmental NGOs). Unfortunately these NGOs failed to give common advice to the early adopters on how to change towards the Davids and innovative Goliaths. So the important push towards green energy is due to the legal framework that allows Davids and Goliaths to divide the costs of the premiums they have to pay for renewable energy fed into their grid among all electricity customers, from the innovators to the laggards. Thus the real innovators on the green electricity market are households producing electricity on their own from renewable sources. This market is on its way to early adopters.

The demand for new, eco-efficient energy facilities and services in private households was mostly pushed by a bundle of activities. For demand-side policy new laws framing better conditions for renewables and changes in the competition on the supply side were important. In spite of these differences it can be stated that the demand for eco-services and products increased in all market fields researched.

In the terms of UNEP (2001), the opportunities for different consumption are the most important aspect in the green energy market. This means that changes in market structures are mainly initiated by government actions and investment (legal framework and supply side). The opportunities for conscious consumption (*How can consumers increase their quality of life by 'choosing and using' more wisely?)* and appropriate consumption (*Are consumption levels sustainable? Is consumption the best way to achieve the desired quality of life?)* were less important at the beginning of green power marketing (but will need more attention in the future).

Figure 19: Integrated analysis of the green power market



Source: Lorek, Lucas

Here, the legal framework is the dominating factor for innovative changes. Attitudes and cultural impacts are widely negligible as energy is not an aspect of great importance for German consumers.

But does this market structure have a future.

A first answer we can give is that a new balance should be established between state and non-state actors. In initiating a reform of market structures, the state is the main actor. But in the next phase more self-regulation is needed. Then the main actors are individual companies or traders. And in future market regulations, market actors such as suppliers, competitors and customers will play the main role. Hence, in agreement with developments in other green markets (e.g. waste management), it can be expected that if market structures become more and more complex, individual companies and traders will become more involved in developing market structures to suit their own purposes. In this case, regulations should focus on process-oriented strategies, like bottom-line networking along some product lines. In other words, the more environmental regulations develop towards a product-oriented strategy, the less regulations are necessary from the state.

4.3 From Niche Markets to Mass Markets – How to Deal With Different Developing Factors?

The use orientation of the customers is, however, based not exclusively on ecological motives, but on a bundle of use expectations such as, for example, better levels of supply, increase in product quality, reduction in costs of use or symbolic attributes such as image effects (see Minsch 1996). Therefore, the chance of leaving the eco-niche is related to a performance which incorporates environmental aspects into a service-oriented strategy.

From the investigated examples, one could already learn about processes of transformation from niche markets to mass markets. It is crucial to the analysis that a given demand of different needs can be met by different offers (e.g. a comfortable dwelling can be maintained either by heating or by insulation) and that these different solutions imply different social economic management by different suppliers.

The results of the two case studies show that the markets of products and services produced or provided in a sustainable way are too different for a general road map. The conditions and structures of supply and demand, the legal framework and cultural settings vary remarkably between different product markets.

Table 5: Structural settings in different utilisation regimes

	Eco-textile market	*Green power market*
Legal framework	XX	XXXXX
Values, attitudes and cultural impacts	XXXXX	XX
Supply side	XXXX	XXX
Demand side	XXXX	X

Very important: xxxxx important: xxxx average: xxx less important: xx unimportant: x

Source: Lorek, Lucas, Wilts 2002

We have learnt that there are several ways of conceiving changes in the utilisation regimes investigated. The first is to consider the multiple, cumulative often incremental changes that occur within the different regimes. These step-by-step innovations may be seen as a smooth reorientation of producers following the market signals of new consumption patterns. Another point is to envisage the process of establishing new quality standards by law or other regulatory instruments to acquire a change in relative prices. Last, and perhaps most contentiously, there may be normative objectives to precipitate or accelerate the process to sustainable consumption. In these cases the emergence of green markets depends on a broad range of market actors. The growth in the renewable energy market is an example showing how conscious choice and overcoming economic as well as political barriers enable a new market segment for green power. The case of the green power market shows the high importance of creating an economic and institutional context for adoption. In the case of green textiles we see that changes mostly require the channelling of new lifestyles and cultural impacts by commercial institutions. If no commitments are made to the first movers in new utilisation regimes, the development would be too fragile to emerge.

The influence of the legislation framework played a less important role in the field of green textiles than in the green market for electricity. Textiles are private consumer goods. In contrast, the production of electricity has always been related to infrastructure development and therefore connected with policy-making. In summary, the two case studies emphasise the persistence of change along different pathways for new ecological markets. Innovation and eco-quality are seen as a result of regulatory assumptions and institutional settings which are linked in an interactive frame with producers and consumers. But having argued this, consumer choices are not only a product of individual needs. Hence future research has to draw attention to the interfaces between regulatory incentives, market activities and behaviour.

5 Outlook on Further Research Demand

In the mainstream of economic science, consumption patterns are understood as a result of rational choices that individuals make. Also the existence of different lifestyles and cultural impacts on consumption are seen as a result of individual acting and decision-making. In contrast to these classical assumptions, we suggest a broader understanding of the dynamics of willingness to consume. In our opinion three perspectives should be taken into account:

- First of all, an economic perspective focusing also on the impact of institutional structures and frames;

- Secondly, a socio-psychological perspective looking at individual behaviour, social relations and different aspects of everyday life;

- Thirdly, symbolic and aesthetical issues regarding the image-building of companies, the advertising of products, and the presentation of persons, ideas and visions (see for further details: www.eventkultur.net).[11]

Decision-making in these three areas is much broader than only the economically relevant behaviour visible on the markets. Furthermore, it includes non-market services like household production and voluntary services, etc. These activities are of remarkable importance for a sustainable quality of life. (Spangenberg, 2002) Accordingly to this, future research has to draw attention to the borderline between market and non-market activities (see Ropke 1999, p. 399–420). These interfaces between supply and demand and between market and private sphere need to be changed in favour of sustainability.

In order to reach a sustainable consumption level in the long run, sustainable consumption strategies cannot rely only on market-based activities. Consumers' decisions are biased if alternatives supporting sustainability are not – or less – available, as a result of adverse information or attitudes or structures, and if this unavailability often has its origin in marketing or policy actions favouring unsustainable production/consumption patterns. Therefore, it seems necessary to extend the approach by examining the allocation process as an interactive system. The question arises how to enhance more equity between the actors of production and consumption. A solution could be active stakeholder dialogues, with NGOs in particular.

[11] see also Lash, S./Urry, J. (1994): Economies of Signs & Space. London.

Taking these assumptions as common ground for further research, it becomes necessary to gain deeper empirical insights into how institutional settings and image-building along brands and companies influence individual behaviour. This research could help to locate the specific characteristics of different markets and point out necessary tools of intervention.

Beside this general question, some detailed knowledge is needed about the following issues:

- Empirical analysis about the interfaces between the different elements of sustainable market development. Those studies should be based on innovation theories understanding the change of market structures as an innovative process. Such an approach offers a quite different view of sustainable consumption opportunities: leaving the normative stage of assessing good and bad consumption, and progressing to the question how the different actors and institutions could innovate.

- It would be useful to create some possible landscapes of successful market introduction. Case studies could specify possible pathways from niche to mass markets. This requires an intensive analysis of the multitude relationships between the stakeholders and the cultural settings. Those studies should take into account previous work done by Scherhorn (Scherhorn, 2001) focusing on markets as collective actions.

- Analysing the conditions governing implementation in the policy area of sustainable consumption – ranging from the interplay between various instruments (or bundles of instruments) to a multitude of actors in all phases of the product chain. The focus should be on how to bring about change in different product and service areas – between vision and reality.

- An open question is how the more lifestyle related markets could be pushed by political regulation. Maybe a new understanding is needed of what regulation really means: only looking at the classical steering factors like prices and legal framework or extending this classical “tool box” to so-called weak instruments like information, communication and symbolic signs. This includes the development of an integrated policy approach on all political levels and research to enhance the understanding of diffusion processes.

- Last but not least, another issue of further research should be to create a regulatory set of different strategies and tools (clarifying the relation between “hard” (statutory) regulations and weak instruments) which are adapted to the different realities of markets. The question of a well-adapted regulation can also be used for further investigations into sustainable market research, analysing regional markets or fair-trade structures alike.

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